

GLOSSARY OF TERMS

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Term	Definition	Translations
acid	A substance releasing hydrogen ions (H ⁺) in aqueous solution. Acidic solutions have a pH value less than 7.	French: acide German: Säure Spanish: ácido
acid hydrolysis of cellulose	A process in which an acid reacts with the cellulose carbohydrate backbone polymer to break the glycosidic bond between the glucose monomers to create shorter cellulose chains.	French: l'hydrolyse acide de la cellulose German: Säurehydrolyse von Cellulose Spanish: la hidrólisis ácida de la celulosa
actinic	Referring to radiation or light capable of bringing about a chemical reaction, usually confined to the ultraviolet and visible light of short wavelengths (blue and green).	French: actinique German: aktinisch Spanish: actínica
albumen	The clear white of hens' eggs: a 10% solution of c. 40 different proteins, collectively referred to as albumin, used as a colloidal binder for photographic printing paper of the same name.	French: albumine German: Albumin (Eiweiß) Spanish: albúmina
alkali, alkaline	A substance releasing hydroxide ions (OH ⁻) in aqueous solution. Alkaline solutions have a pH value greater than 7.	French: alcali, alcalin German: Alkali (Laugensalz), alkalisch Spanish: álcali/ alcalina/o
alkaline reserve	An excess of calcium or magnesium bicarbonate/carbonate beyond that necessary to create alkaline paper. It promotes preservation of the paper by reacting with and neutralizing acids formed during normal aging. Frequently 2% or more results in a pH of 8.5 or greater.	French: réserve alcaline German: Alkalireserve Spanish: reserve alcalina
alkyl ketene dimer	A synthetic sizing agent applied during the production of alkaline or neutral paper. Trade name, Aquapel. <i>See</i> size.	French: dimère d'alkylcétène German: Alkylketendimer Spanish: dímero de alquil ceteno
alum	Double salts of aluminum sulfate with alkali metal cations. The most common is potassium aluminum sulfate dodecahydrate, KAl(SO ₄) ₂ •12H ₂ O. This "potash alum," used in fine handmade papers and photographic raw stock, should be distinguished from the lesser-quality "papermaker's alum," which is often contaminated with iron.	French: alun German: Alaun Spanish: alumbre
alum-rosin size	An internal sizing agent used for photographic papers, primarily composed of alum, rosin, and starch.	French: encollage alun-colophane German: Harz-Alaun-Leimung Spanish: encolante de colofonia-alumbre
alumino-silicate	A group of minerals containing aluminum and silicon linked by oxygen, and sometimes metal cations; typically clays such as kaolin.	French: silicate d'aluminium German: Aluminumsilikat Spanish: silico-aluminato
ambient	Referring to the properties of the surrounding environment, e.g., its temperature or relative humidity.	French: ambiant German: umgebend (Umgebungs...) Spanish: ambiente
amorphous	A solid not possessing a regular crystalline structure, e.g., a glassy substance.	French: amorphe German: amorph Spanish: amorfo
aniline process	A reprographic process invented by William Willis Sr. in 1864 in which dichromated paper is the photosensitive component. On development with aniline (aminobenzene), the residual dichromate oxidizes it to blue-black dyestuffs.	French: procédé à l'aniline German: Anilinverfahren Spanish: proceso de anilina
anion	A negatively charged molecule or atom, arising through gain of electron(s) by the neutral entity. The charge on an anion is always a whole number, written x ⁿ⁻ , where x is the element and n ⁻ is the number of units of charge of the electron. <i>See</i> cation; ion.	French: anion German: Anion Spanish: anión

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aqua regia	A mixture of concentrated hydrochloric acid and concentrated nitric acid, in the approximate volume proportions of 3:1. Latin for “royal water,” so called because it is capable of dissolving the “royal” metal, gold.	French: eau régale German: Königswasser Spanish: agua regia
aqueous	Watery; usually referring to a solution of a substance in water.	French: aqueux German: wässrig Spanish: acuoso
argentotype	A siderotype process invented by Sir John Herschel in 1842 in which the photoproduct from exposure of ammonium ferric citrate reduces silver nitrate to silver metal, which constitutes the image.	French: argentotype German: Argentotypie Spanish: argentotipo
atom	The smallest neutral particle of a chemical element that retains the essential identity of that element.	French: atome German: Atom Spanish: átomo
atomic number	A sequential number allocated to each element numerically equal to the number of protons in the atomic nucleus and, therefore, also equal to the number of orbiting electrons in the neutral atom. <i>See</i> periodic table.	French: numéro atomique German: Ordnungszahl Spanish: número atómico
atomic weight	The averaged mass of the atoms of an element on a scale relative to the most abundant isotope of carbon, having a value of 12.0000. On this scale the oxygen atom has a value of 15.999, and the hydrogen atom 1.008. Now called “relative atomic mass.”	French: masse atomique German: Atomgewicht Spanish: peso atómico
Autochrome	A color transparency on glass produced via an additive color process in use from 1907 to 1935.	French: Autochrome German: Autochrom Spanish: Autocromo
autoplatinography	The process in which a mirror image forms spontaneously over a period of time on a paper adjacent to a platinum-containing print. Usually the image is a positive, but it may sometimes be a negative. Also referred to as “ghost image” or “platinum image transfer.”	French: auto-platinographie German: (Platin Bildübertragung) Spanish: auto-platinografía
baryta	Barium sulfate, BaSO ₄ , a dense white pigmented layer used in photographic papers, situated between the emulsion and the paper.	French: baryte German: Baryt Spanish: barita
base	A substance that reacts with an acid to give a salt, plus water. All alkalis are bases, but not all bases are significantly alkaline (e.g., some water-insoluble metal oxides).	French: base German: Base Spanish: base
bichromate	<i>See</i> dichromate.	French: bichromate German: Bichromat Spanish: bicromato
bleaching powder	Principally calcium hypochlorite, Ca(ClO) ₂ , an inorganic compound used in water as a disinfectant and oxidizing bleach.	French: poudre de blanchiment German: Bleichpulver Spanish: polvo blanquador
Blue Wool Standards	Wool fabric swatches with varying amounts of blue dyes of known fading rates used to compare lightfastness of materials, originally developed by the British textile industry as standards. The dye mixtures are selected so that each successive Blue Wool fades at half the rate of the preceding Blue Wool. Blue Wool 1 is the most light sensitive, and Blue Wool 8 the most lightfast. Objects that change color at a similar rate to Blue Wool Standards 1–3 are considered light sensitive.	French: étalons de laine bleue [ISO 105-B08 : 2000] German: Blaumaßstäbe Spanish: Estándar de lana azul
buffer	A substance or mixture of substances that helps to maintain a fixed pH. The pH value of its solution is only slightly affected by the addition of moderate amounts of either acid or alkali.	French: tampon German: Puffer Spanish: búfer/amortiguador
calendering	The process of creating a smooth and compact surface by passing paper through a stack of metal rollers (often heated). Sometimes used interchangeably with “unglazed” or “hot press.”	French: calandrage German: Kalandrieren Spanish: calandrar

Term	Definition	Translations
calotype	A paper negative process invented by William Henry Fox Talbot in which the paper is sensitized with silver iodide. The perfected calotype, also known as the Talbotype, was introduced in 1841.	French: calotype German: Kalotypie Spanish: calotipo
carbon print	A photographic printing process in which the image is formed by the hardening of a dichromated colloid (gelatin) containing lampblack (carbon). Pigments of other colors may also be used.	French: tirage au charbone German: Kohledruck Spanish: impresión al carbón
catalyst	A substance that accelerates a chemical reaction but is left unchanged at the conclusion of it. The process is called “catalysis.”	French: catalyseur German: Katalysator Spanish: catalizador
catatype	An image-forming process in which a print is made using only chemical catalysis (without light). It was invented in 1903 by Wilhelm Ostwald, who used negative platinum prints to repeatedly catalyze the formation of red-toned images in contact with paper coated with an unstable combination of oxidant and reductant.	French: catatype German: Katatypie Spanish: catatipo
cation	A positively charged molecule or atom, arising through removal of electron(s) from the neutral entity. It is written x^{n+} , where x is the element and n^+ is the number of units of charge of the protons that are present. <i>See</i> anion; ion.	French: cation German: Kation Spanish: catión
cellulose	The chief constituent of plant cell walls, a polysaccharide of formula $(C_6H_{10}O_5)_n$, where $n \approx 15,000$. Purified cellulose is isolated through the chemical and physical breakdown of grasses, seed hairs, wood, and discarded textiles, primarily cotton and linen rag.	French: cellulose German: Cellulose (Zellulose) Spanish: celulosa
Celsius	The temperature scale also known as Centigrade, which has now replaced the Fahrenheit scale in most of the world. The conversion formulas are: $^{\circ}C = 5(F-32)/9$ $^{\circ}F = 32 + 9C/5$ Pure water freezes at $0^{\circ}C$ ($32^{\circ}F$) and boils at $100^{\circ}C$ ($212^{\circ}F$) under normal atmospheric conditions. Normal room temperature is c. $20^{\circ}C$ ($68^{\circ}F$).	French: Celsius German: Celsius Spanish: Celsius, centígrados
chelate	A metal compound, or complex, in which the metal cation is bound by a ligand via two or more atoms of the same molecule. Derives from the Greek word for “crab’s claw.”	French: chélate German: Chelat Spanish: agente quelante
chemical bleaching	The use of oxidizing or reducing materials that interact with the bonds of chromophores, rendering them colorless.	French: blanchiment chimique German: chemisches Bleichen Spanish: blanqueo o decoloración química
chemistry	A term used by photographers as a synonym for “chemicals” or “chemical solution.”	French: chimie German: Chemie Spanish: química
Chine collé	A printmaking technique in which the image is printed on a delicate paper that is mounted to a thicker paper, resulting in finer detail.	French: Chine collé German: Chine collé Spanish: Estampación sobre papel de China
chromophore	A chemical group within a molecule that absorbs and reflects light at a specific frequency, imparting a specific color to that molecule.	French: chromophore German: Chromophor Spanish: cromóforo
chrysochrome	A siderotype process invented by Sir John Herschel in 1842 in which the photoproduct from exposure of ammonium ferric citrate reduces gold chloride to gold metal, which constitutes the image.	French: chrysochrome German: Chrysotypie Spanish: crisotipo
citrate	An organic anion derived from citric acid, $C_6H_8O_7$, which can lose up to 3 hydrogen ions in forming salts.	French: citrate German: Citrat (Zitrat) Spanish: citrato
clearing	The removal of excess unreacted chemicals and reaction products from a photographically printed image, generally used in association with siderotype processes. <i>See</i> fixing.	French: éliminateur German: Klären Spanish: aclarar/remover

Term	Definition	Translations
cm³	Abbreviation for cubic centimeter. Also written as “cc.” It is the same as a milliliter (ml).	French: cm ³ German: cm ³ Spanish: cm ³
coating	A superficial layer, such as wax or varnish, applied to the surface of a photograph to provide protective or aesthetic functions.	French: couche German: Beschichtung Spanish: recubrimiento
coating weight	A measure of the surface concentration of a substance (e.g., a sensitizer or image pigment) as the mass per unit area of a paper sheet (or other substrate), often expressed as grams per square meter, g/m ² .	French: poids de couche German: Auftragsgewicht/ Beschichtungsgewicht Spanish: peso o concentración del recubrimiento
cold pressed (CP)	In papermaking, having a natural grain or subtle surface texture created by the first pressing between felts. Used interchangeably with “NOT,” a description for papers “not hot pressed.”	French: pressée à froid German: kaltgepresst Spanish: prensado en frío
collodion	A solution of cellulose nitrate dissolved in a 60:40 mixture of diethyl ether and ethanol, used as a binder layer for photographically sensitized plates and papers.	French: collodion German: Kollodium (Celloidin, Zelloidin) Spanish: colodión
colloid	A solid or liquid mixture containing particles ranging between 1 and 1000 nanometers in diameter, which remain evenly distributed throughout and do not settle out or precipitate. Common examples are milk, cheese, paint, and whipped cream.	French: colloïde German: Kolloid Spanish: coloïde
complex	A chemical compound formed from one or more ligands binding to a metal cation.	French: complexe German: Komplex Spanish: complejo
complexing agent	Another name for a “ligand.” <i>See also</i> chelate.	French: agent complexant German: Komplexbildner Spanish: agente complejante
compound	The pure substance resulting from two or more elements entering into chemical combination.	French: composé German: Verbindung Spanish: compuesto
concentration	The amount of one substance dispersed within a perfectly homogeneous mixture. Most commonly, it applies to solutions in water or other liquids and can be measured in several different ways: %w/w; %w/v; %v/v; g/l; molarity (mol/l).	French: la concentration German: Konzentration Spanish: concentración
copy negative	A negative made by photographing an existing positive image, such as a print, to be printed in the desired format, the “copy print.” <i>See also</i> duplicate negative; interpositive.	French: copie négative German: Kopiernegativ Spanish: negativo de copia o de copiado
crystalline	A solid that has a regular repeating lattice structure of atoms, molecules, or ions.	French: cristallin German: kristallin Spanish: cristalino/a
cyanotype	A siderotype process invented by Sir John Herschel in 1842 in which the photo-product from exposure of ammonium ferric citrate reacts with a ferricyanide to give Prussian blue, ferric ferrocyanide, which constitutes the image.	French: cyanotype German: Cyanotypie Spanish: cianotipo
cylinder mold machine	A papermaking machine with a hollow, rotating drum used to support a layer of pulp on a laid or woven screen. Cylinder-mold papers have features similar to handmade papers, including four deckle edges and watermarks, and are often sized and dried in a manner similar to that used for handmade sheets. The papers exhibit minimal to no grain direction.	French: machine de forme cylindre German: Rundsiebpapiermaschine Spanish: máquina de molde de cilindro
dandy roll	A revolving cylinder on a Fourdrinier machine used to compress the surface and impart an imitation laid pattern or watermark in the damp web of paper.	French: rouleau filigrane German: Egotteur Spanish: rodillo filigranador
deckle	A removable wooden frame that sits on top of the hand papermaking mold, used to contain the paper pulp within its edges. Paper pulp caught beneath the deckle creates an irregular edge known as a “deckle edge.”	French: barbe, bord à la cuve German: Formrahmen (Büttenrand) Spanish: bastidor

Term	Definition	Translations
deliquescence	Property of a solid having a tendency to absorb water from the atmosphere and then dissolve in it, forming a solution.	French: déliquescence German: Deliqueszenz Spanish: delicuescente
density (optical)	In photography, the logarithm of the opacity: $D = \log_{10}(I_0/I_t)$ or $10^D = I_0/I_t$ where I_0 is the intensity of incident light and I_t is the intensity of transmitted light.	French: densité (optique) German: Dichte Spanish: densidad (óptica)
density (physical property)	The property of a substance expressed by its mass per unit volume, e.g., g/cm ³ .	French: densité (propriété physique) German: Dichte Spanish: densidad (propiedad física)
density range	The difference in optical density between the lightest and darkest parts of an image.	French: intervalle de densité German: Dichtumfang Spanish: rango de densidad
desiccant	A substance that readily absorbs water from the atmosphere, such as anhydrous calcium chloride or silica gel, used to create a dry chamber, e.g., for the storage of sensitized but unexposed papers. <i>Contrast with</i> humectant.	French: déshydratant German: Trockenmittel Spanish: desecante
developer	A chemical reagent used to treat an exposed photographic paper to bring out the final image in a stable substance.	French: révélateur German: Entwickler Spanish: revelador
develop-out process (DOP)	A photographic printing process in which the latent image of an exposed sensitized paper is converted into a visible image through the use of developing chemicals.	French: procédé à développement German: Entwicklungsverfahren Spanish: proceso de revelado
diapositive	A positive transparency on plastic film base or glass. <i>See</i> interpositive.	French: diapositive German: Diapositiv Spanish: diapositiva
dichromate	The chromium-containing anion Cr ₂ O ₇ ²⁻ historically called bichromate. Dichromate salts (e.g., potassium dichromate, K ₂ Cr ₂ O ₇) are strong oxidizing agents and, in the presence of light, will act to harden colloids such as gelatin or gum Arabic. <i>See also</i> aniline process; carbon print; gum dichromate process; gum gravure; gum platinum print; oil pigment print; photogravure.	French: dichromate, bichromate German: Dichromat Spanish: dicromato
direct duplicate negative	A duplicate negative produced directly from an original negative. Silver gelatin reversal films are exposed (in contact with the original or by enlargement) and developed but not fixed, followed by bleaching of the metallic silver. The remaining silver salts are then exposed to light, developed, and fixed.	French: contretypé négatif directe German: Direktduplikatnegativ Spanish: duplicado negativo directo
direct enlargement	A print made by projecting light through the original negative and a focused optical system onto sensitized photographic paper.	French: agrandissement direct German: direkte fotografische Vergrößerung Spanish: ampliaciones directas
D-Max	Abbreviation for “maximum density,” the darkest image tone possible for a particular photographic paper type and image, or the most opaque area of a negative.	French: D-Max German: D-Max Spanish: D-Max
D-Mid	Abbreviation for “middle density,” the mid-tonal range between the maximum and minimum tones possible for a particular photographic paper type and image, or between the most and least opaque areas of a negative.	French: D-Mid German: D-Mid Spanish: D-Med
D-Min	Abbreviation for “minimum density,” the minimum discernible difference between the paper tone and the image on a print paper, or the minimum discernible opacity of a negative.	French: D-Min German: D-Min Spanish: D-Min
duplicate negative	A copy of an original negative made by first exposing it onto a plate or film to create an interpositive transparency. The interpositive is then exposed onto a plate or film to create the transparent duplicate negative. <i>See</i> direct duplicate negative. <i>See also</i> copy negative; interpositive.	French: contretypé négatif German: Duplikatnegativ Spanish: negativo duplicado
effervescence	The evolution of a gas, as bubbles, from a liquid.	French: effervescence German: Sprudeln Spanish: efervescente

Term	Definition	Translations
electron	The fundamental particle of negative charge.	French: électron German: Elektron Spanish: electrón
electrostatic potential	The amount of electric potential energy on a surface created by buildup of charge.	French: potentiel électrostatique German: elektrostatisches Potential Spanish: potencial electrostático
element	A fundamental constituent of matter that cannot be split into simpler constituents by chemical means. It consists of one type of atom only, with a characteristic atomic number. <i>See</i> periodic table.	French: élément German: Element Spanish: elemento
emulsion	A mixture of two or more liquids in which one or more liquids remain distinct and suspended in the other. It is a colloid in which all components are liquid. In photography, the term describes photosensitive image materials, such as silver halide, suspended in a gelatin or collodion. Note: siderotypes consist of aqueous solutions of photosensitive image materials, such as platinum or palladium, and are therefore not emulsions.	French: émulsion German: Emulsion Spanish: emulsión
energy dispersive spectrometry (EDS)	An analytical technique in which high-energy radiation interacts with the surface of a sample, and the number and energy of the x-rays emitted by the sample are detected as a means to identify the elemental composition of the substance. <i>See also</i> scanning electron microprobe–energy dispersive spectrometry; x-ray fluorescence spectrometry.	French: spectrométrie de rayons X à dispersion d'énergie German: energiedispersive Röntgenspektroskopie Spanish: espectrometría de energía dispersiva
equimolar	Having equal amounts or concentrations on the molar scale of two chemical components, i.e., equal numbers of moles.	French: équimolaire German: äquimolar Spanish: equimolar
etching	<i>See</i> intaglio.	French: eau-forte German: Ätzung Spanish: aguafuerte
exposure (photographic)	Intensity of light multiplied by the duration of the exposure: exposure = illumination × time. Usually given the symbol “H.” The basic units of exposure in photography are lux seconds.	French: exposition (photographique) German: Belichtung Spanish: exposición (fotográfica)
exposure scale	The number of stops of exposure needed to transform a photographic material from the minimum optical density (usually white) of the paper base to the maximum density (black or other color). It may also be expressed as a \log_{10} (exposure) value, where 0.3 = 1 stop and the scale is additive.	French: échelle des valeurs d'exposition German: Belichtungsskala Spanish: escala de exposición
Fahrenheit	<i>See</i> Celsius.	French: Fahrenheit German: Fahrenheit Spanish: Fahrenheit
faux platinum	Matte silver papers made to mimic the appearance of platinum prints.	French: faux platine German: Platino-Bromsilberpapier Spanish: falso platino
ferric, ferrous	The names given to the element iron when chemically combined in its two most common oxidation states of +3 and +2, respectively, the cations Fe^{3+} and Fe^{2+} . Modern terminology uses “iron(III)” and “iron(II).”	French: ferrique, ferreux German: ferri, ferro Spanish: férrico/a, ferroso/a
fix, fixer, fixing	The removal of excess unreacted chemicals and reaction products from a photographically printed image. The term is generally used in association with silver halide processes. <i>See also</i> clearing; hypo.	French: fixer, fixateur, fixation German: Fixieren, Fixierbad, Fixierung Spanish: fijar, fijador, fijado
fluid ounce	A unit of liquid volume: 1 fluid ounce (UK) = 28.412 cm ³ 1 fluid ounce (US) = 29.573 cm ³	French: once liquide German: flüssige Unze Spanish: onza líquida
formula (chemical)	The relative numbers of atoms of the elements making the composition of a pure substance, written using the symbols for the chemical elements.	French: formule (chimique) German: Formel Spanish: formula química

Term	Definition	Translations
formula weight	<i>See</i> relative molecular mass.	French: poids de la formule German: Formelgewicht Spanish: peso molecular
Fourdrinier machine	A papermaking machine that discharges pulp onto a continuously revolving screen, or “wire,” to make an “endless web” of paper.	French: machine à Fourdrinier German: Langsiebmaschine Spanish: máquina Fourdrinier
Fourier transform infrared spectroscopy (FTIR)	An analytical technique in which infrared light interacts with the vibrations in the molecules of a sample and is collected and mathematically converted by means of the Fourier transform to a frequency spectrum. It identifies classes of compounds, such as oils, waxes, resins, and synthetic polymers, and is complementary to Raman spectroscopy.	French: spectroscopie infrarouge à transformée de Fourier (FTIR) German: Fouriertransform-Infrarotspektroskopie Spanish: espectroscopia infrarroja con transformada de Fourier
functional groups	The specific arrangement of atoms or bonds within a molecule that gives a molecule its particular characteristics and determines how it reacts chemically.	French: groupes fonctionnels German: funktionelle Gruppe Spanish: grupos funcionales
gas chromatography–mass spectrometry (GC-MS)	An analytical technique that can be used to identify an unknown material by separating its components in the gas phase by their differential volatility, then ionizing and fragmenting each component to generate a mass spectrum.	French: chromatographie en phase gazeuse couplée à la spectrométrie de masse (GC MS) German: Gaschromatografie-Massenspektrometrie Spanish: cromatografía de gases-espectrometría de masas
gelatin, gelatine	A complex organic macromolecular material comprised of a mixture of proteins obtained from animal skins, hooves, and bones, used as a colloidal binder in the preparation of photographic emulsions and as a sizing agent for some papers.	French: gélatine German: Gelatine Spanish: gelatina
ghost image	<i>See</i> autoplating.	French: image fantôme German: Geisterbild Spanish: imagen fantasma
grain	An obsolete unit of weight, abbreviated as “gr.” Avoid confusion with grams (g): 1 grain = 0.0648 grams	French: grain German: Gran Spanish: grano
grain direction	The alignment of paper fibers created by conditions of the sheet formation, particularly strong in papers made on the Fourdrinier machine. When wet, paper expands more in the direction perpendicular to grain direction, as fibers swell across their width. Paper tears more easily parallel to the grain direction.	French: sens des fibres papier German: Faserrichtung Spanish: dirección de fibra
gum dichromate process	A photographic printing process that relies on the hardening effect of potassium dichromate on gum Arabic upon light exposure. The soft, unexposed gum is washed away with water, leaving a hardened gum layer, which has usually been mixed with pigments, in the exposed regions. Also called “gum bichromate.”	French: procédé à la gomme bichromatée German: Gummidruck (Gummidichromatverfahren) Spanish: proceso de goma bicromatada
gum gravure	An intaglio process similar to photogravure invented by Heinrich Kühn in 1911 that uses gum dichromate in preparation of the printing plate. The prints made using this process more closely resembled gum dichromate prints than reproductions of photographs.	French: gomme héliogravure German: Gummigravur Spanish: grabado a la goma
gum platinum print	The combination of a gum dichromate print superimposed on a platinum print to exploit the aesthetic characteristics of both. Also called “gum dichromate over platinum print” and “gum over platinum print.”	French: tirage gomme-platine German: Gummi-Platindruck Spanish: impresión al platino y a la goma
halftone	A technique used to break up continuous or gradual tones into small dots for use in photomechanical printing. The dots may be regularly spaced dots, squares, ruled lines, or other patterns, or may be random shapes and sizes depending on the method used to produce the dots. The resulting image is printed in ink using relief, intaglio, or planographic methods.	French: demi-ton German: Raster, Rasterbild (halftone image) Rasterdruck (halftone print) Autotypie (letterpress halftone print) Spanish: medio tono

Term	Definition	Translations
halides	Any of the singly charged anions—fluoride, chloride, bromide, or iodide—of the group of elements in the periodic table known as the halogens (fluorine, chlorine, bromine, and iodine), in combination with other elements. All metals can form halides.	French: halogénures German: Halogenid Spanish: halogenuro
hardening	The process of rendering colloids such as gelatin or gum insoluble in water. Also resembles tanning.	French: durcissement German: Härtung Spanish: endurecimiento
Hollander beater	A grinder used in papermaking to macerate paper pulp, consisting of a heavy cylinder with sharp metal bars that turn against a metal bed plate.	French: pile hollandaise, pile raffineuse German: Papierholländer Spanish: pila holandesa
homogeneous	Uniform throughout, with no internal boundaries or surfaces.	French: homogène German: homogen Spanish: homogéneo
hot pressed (HP)	In papermaking, having a compacted surface imparted by heavy pressure between polished metal plates or rollers, which were traditionally heated. Sometimes also used to refer to unglazed or calendered surfaces made by repeated passes through a stack of metal rollers after drying.	French: pressé à chaud (HP) German: heiss gepresst Spanish: prensado en caliente
humectant	A substance that tends to attract moisture and is used to keep things moist. <i>Contrast with</i> desiccant. <i>See also</i> deliquescence; hygroscopic.	French: humectant German: Feuchthaltemittel Spanish: humectante
humidify	To add water vapor to the atmosphere, usually in an enclosed container or space.	French: humidifier German: befeuchten Spanish: humedada
hydrate (noun)	A solid containing water of crystallization, a hydrated salt.	French: hydrate (nom) German: Hydrat Spanish: hidrato
hydrate (verb)	To allow to take up water, often from the vapor, to humidify.	French: hydrater (verbe) German: hydratisieren Spanish: hidratar
hydration	The process of taking up or absorbing water.	French: hydratation German: Hydratation Spanish: hidratación
hydrogen ion	The ionized hydrogen atom, H ⁺ , also called a “proton.” With water it forms the hydronium ion, H ₃ O ⁺ , and with ammonia it forms the ammonium ion, NH ₄ ⁺ .	French: ion hydrogène German: Wasserstoffion Spanish: ion de hidrogeno
hydrolysis	Decomposition of a substance by water or alkali (OH ⁻); in the case of a metal salt, to give the metal hydroxide or (sometimes) oxide.	French: hydrolyse German: Hydrolyse Spanish: hidrólisis
hydrometer	A device for measuring the relative density (specific gravity) of liquids by means of the partial immersion of a calibrated float.	French: Hydromètre German: Aräometer Spanish: hidrómetro
hydrophilic	Having an affinity for water.	French: hydrophile German: hydrophil Spanish: hidrofílico/a
hydrophobic	Having the property of repelling water.	French: hydrophobe German: hydrophob Spanish: hidrofóbico/a
hygrometer	An instrument for measuring relative humidity (RH) in the air.	French: hygromètre German: Hygrometer Spanish: higrómetro
hygroscopic	Having a tendency to absorb water from the atmosphere. <i>See also</i> deliquescence; humectant.	French: hygroscopique German: hygroskopisch Spanish: higroscópico/a

Term	Definition	Translations
hypo	An obsolete nineteenth-century name, still used by some photographers, which is short for “hyposulphite of soda,” the substance now called “sodium thiosulfate.” It is the fixing agent used in silver photography because of its ability to dissolve silver halides. <i>See also</i> clearing; fixer.	French: fixateur German: Fixiersalz Spanish: hipó
infrared (IR)	Electromagnetic radiation having wavelengths ranging from 700 nm to about 1 mm, and thus of longer wavelength and lower energy than visible light. The absorption of infrared radiation generates heat.	French: infrarouge (IR) German: Infrarot Spanish: infraroja
intaglio	A method of printmaking in which the recessed portion of a plate receives ink that is then transferred to a dampened paper. Examples include photogravure, etching, and engraving.	French: impression en creux German: Tiefdruck Spanish: grabado en hueco
intensification, intensifying	A process intended to increase the contrast of the finished print or negative. Intensification of prints can result in color changes, a side effect that was often exploited by photographers.	French: intensification intensifier German: Verstärkung Spanish: intensificación intensificar
interleaving paper	Lightweight paper placed next to an image or text to protect the surface and to prevent the image or text from transferring to or reacting with an adjacent material.	French: papier intercalaire German: Zwischenlagepapier Spanish: papel de intercalado
interpositive	A positive transparency made from an original negative, used to produce a duplicate negative. <i>See</i> diapositive.	French: interpositif German: Interpositiv Spanish: interpositivo
ion	An atom or molecule that carries an electric charge, due to gain or loss of electrons. The charge is written as a superscript following the chemical symbol, e.g., Fe ³⁺ . <i>See</i> anion; cation.	French: ion German: Ion Spanish: ion
Japine	The proprietary term for a partially parchmented paper, sensitized with platinum, palladium, and silver, produced by the Platinotype Company.	French: Japine German: Japine Spanish: Japine
kallitype	A siderotype process invented by W.W.J. Nicol in 1889 in which the photoproduct from exposure of ferric oxalate reduces silver nitrate to give a silver image.	French: kallitype German: Kallitypie Spanish: kalitipo
kaolin	A clay composed chiefly of the soft, white aluminosilicate mineral kaolinite, Al ₂ Si ₂ O ₅ (OH) ₄ . In addition to its use in porcelain manufacture, kaolin is employed as a filler in papermaking to provide a glossy surface. Also known as “China clay.”	French: kaolin German: Kaolin Spanish: caolín
kelainotype	A siderotype process invented by Sir John Herschel in 1842 in which the photoproduct from exposure of ammonium ferric tartrate reduces mercuric chloride or nitrate to mercury metal, which constitutes the image, but which proves highly impermanent.	French: kelainotype German: Kelainotypie Spanish: kelainotipo, celaenotipo
laid paper	Handmade or cylinder-mold paper with closely spaced parallel lines of thin pulp distribution, imparted by the wire screen on which the pulp settles during sheet formation. Laid lines are always accompanied by widely spaced, perpendicular chain lines. Imitation laid paper can be made on a Fourdrinier machine by impressing wire lines into damp paper using a dandy roll.	French: papier vergé German: Büttenpapier (geripptes Papier) Spanish: papel vergé
laminar structure	Having a layered structure; in the context of photographic prints on paper, having more than one layer (e.g., support, binder, etc.).	French: structure stratifiée German: laminare Struktur Spanish: estructura laminar, en capas
latent image	The product of the initial effect of light on a crystal of silver halide to produce a sensitivity speck consisting of a few atoms of silver, which renders the whole crystal reducible into a grain of silver metal by a suitable developing agent. The latent image is invisible to the naked eye.	French: image latente German: latentes Bild Spanish: imagen latented
ligand	Any molecule or ion capable of binding chemically to a metal cation to give a molecular compound called a metal complex.	French: ligand German: Ligand Spanish: ligando

Term	Definition	Translations
light-valve technology (LVT)	A high-resolution, continuous-tone film recorder that exposes directly onto photographic film. Continuous-tone devices offer very smooth gradations with no “dots,” as in inkjet output.	French: technologie de modulateur de lumière German: Lichtventil-Technologie Spanish: tecnología de válvula de luz
matte collodion	A photographic print in which the silver particles creating the image are dispersed in a collodion binder that incorporates matting agents to diminish surface gloss.	French: collodion mat German: Mattkollodium Spanish: colodión mate
mellowing	The use of organic materials, such as black tea, to give an overall tone to paper. <i>See tinting.</i>	French: adoucissement German: tonen, färben Spanish: entintar, entonar
mercury-processed	Referring to a platinum or palladium print that has had a mercury salt added during sensitization, developing, or both, to adjust the tonality of the print.	French: traité au mercure German: mit Quecksilber verarbeitet Spanish: procesado con mercurio
microfade testing (MFT)	An analytical test in which a very small area of an object is exposed to a very intense light source to evaluate the overall lightfastness of the object.	French: évaluation du micro-vieillessement à la lumière German: Micro-Fadingtester Spanish: prueba de micro-desvanecimiento
mirroring, silver mirroring, silvering out, silvering	A reflective sheen on the surface of photographic materials, both negative and positive. In platinum images, it is associated with the presence of mercury. In silver images, it is associated with oxidation and subsequent reduction of image silver.	French: reflet métallique, miroir d'argent German: Spiegeleffekt, Aussilberung Spanish: espejeo, espejo de plata
molar ratio	The relative proportions of two substances expressed in terms of their respective numbers of moles, i.e., their relative numbers of molecules, atoms, ions, etc.	French: rapport molaire German: Molverhältnis Spanish: proporción molar
molarity (M, mol/l)	The concentration of a solution expressed as the number of moles of solute dissolved in one liter of the solution.	French: molarité German: Molarität Spanish: molaridad
mole	A unit used to measure the amount of a pure substance. One mole of any substance always contains the same number of molecules, atoms, ions, etc., equal to Avogadro's number = 6.022×10^{23} . One mole of a substance is equal to its formula weight or relative molecular mass measured in grams.	French: môle German: Mol Spanish: mol
molecular formula	The numbers of atoms of different chemical elements combined within a molecule of a compound, sometimes including an indication of the way they are bonded together.	French: formule moléculaire German: Summenformel Spanish: fórmula molecular
molecular weight	<i>See relative molecular mass.</i>	French: poids moléculaire German: Molekulargewicht Spanish: peso molecular
molecule	The smallest and simplest particle of a chemical substance or compound that retains the identity of the whole, composed of atoms chemically bonded in fixed proportions.	French: molécule German: Molekül Spanish: molécula
mold (US), mould (UK)	A rectangular wooden frame with a series of supporting ribs and a laid or woven screen made of wire used with a deckle to make handmade sheets of paper.	French: moule German: Formrahmen Spanish: molde
nanometer (nm)	Unit of length equal to one billionth (10^{-9}) of a meter.	French: nanomètre (nm) German: Nanometer Spanish: nanómetro
nanoparticle	A particle of a substance having a size between approximately 1 and 200 nm, which is between that of an atom and the wavelength of visible light.	French: nanoparticule German: Nanopartikel Spanish: nanopartículas
neutral	Neither acid nor alkaline, having no electrical charge.	French: neutre German: neutral Spanish: neutral

Term	Definition	Translations
noble metal	Metallic elements that resist oxidation and corrosion, such as platinum, palladium, gold, and silver.	French: métal noble German: Edelmetall Spanish: metal noble
not hot pressed (NOT)	<i>See</i> cold pressed.	French: non pressé à chaud German: nicht heiß gepresst Spanish: no prensado en caliente (prensado en frío)
oil pigment print, oil pigment transfer print	A planographic printing process in which hardened gelatin is used as an ink resist. The pigmented image can then be dried to produce an oil pigment print or transferred to another piece of paper using a printing press to produce an oil pigment transfer print. <i>See</i> dichromate.	French: tirage à l'huile pigment, pigment d'huile impression par transfert German: Öldruck, Ölumdruck Spanish: impresión de pigmento/aceite u oleo, impresion de pigmento/aceite u oleo por transferencia
ox gall	A purified form of ox bile used as a wetting agent.	French: fiel de bœuf German: Ochsen-galle Spanish: hiel de buye
oxalate	A salt containing the oxalate anion, $C_2O_4^{2-}$, derived from oxalic acid, $H_2C_2O_4$.	French: oxalate German: Oxalat Spanish: oxalato
oxidation	The removal of electrons from an atom or molecule, in consequence of which it becomes more positively charged (or less negatively charged); an increase in the oxidation state of an atom or ion. <i>Contrast with</i> reduction.	French: oxydation German: Oxidation Spanish: oxidación
oxidation state	A formal electric charge assigned to an atom, calculated from the number of electrons it has effectively lost or gained compared with the neutral atom. Written in parentheses as Roman numerals following the name or symbol of the element, e.g., iron(III) or Fe(III).	French: état d'oxydation German: Oxidationsstufe, Oxidationszahl, Oxidationszustand Spanish: estado de oxidación
Palladiotype	The Platinotype Company's proprietary brand name for a siderotype process introduced in 1917 by William Willis Jr., in which the photoproduct from exposure of ferric oxalate reduces sodium tetrachloropalladate to give a palladium image.	French: palladiotype German: Palladiotypie Spanish: paladiotipo
parchmentization	A process of treating paper with sulfuric acid to improve its resistance to water, heat, oil, and abrasion. Sulfuric acid converts crystalline cellulose to a gelatinous, amorphous state, creating a hard, closed surface and translucent appearance. <i>See also</i> Japine.	French: parcheminage German: Pergamentierung Spanish: apergaminar
periodic table	A sequential arrangement of all the known elements, in order of increasing atomic number, in which elements having similar outer electron configurations, and therefore similar chemistry, are tabulated in the same vertical column, called a "group."	French: tableau périodique German: Periodensystem Spanish: tabla periódica
pH	A measure of the acidity or alkalinity of a solution, usually aqueous, equal to the logarithm of the reciprocal of the hydrogen ion molarity: $pH = \log_{10} 1/[H^+]$ or $pH = -\log_{10}[H^+]$ Each unit decrease in the pH represents a tenfold increase in the acidity. <i>See</i> acid; alkali	French: pH German: pH-Wert Spanish: pH
photo ceramic	A photographic image formed upon, or transferred to, a ceramic substrate, and often fired under a glaze to render it highly permanent.	French: photo-céramique German: Fotokeramik (Photokeramik) Spanish: foto cerámica
photochemistry	The study of chemical changes brought about by the absorption of light. <i>See</i> actinic.	French: photochimie German: Fotochemie (Photochemie) Spanish: fotoquímica
photogravure	An intaglio photomechanical printing process in which a hardened gelatin film is adhered to a copper printing plate to act as an acid resist during etching. <i>See</i> dichromate.	French: photogravure German: Heliogravüre, Fotogravüre (Photogravüre) Spanish: fotograbado

Term	Definition	Translations
photon	The fundamental particle of light.	French: photon German: Photon/Lichtquant Spanish: fotón
photoproduct	A substance produced by a photochemical reaction.	French: photoproduit German: Fotoprodukt (Photoprodukt) Spanish: foto producto
photosensitizer	A substance capable of responding to light by undergoing some physical or chemical change.	French: photo-sensibilisateur German: Fotosensibilisator (Photosensibilisator) Spanish: foto sensibilizador
planographic	Referring to any method of printmaking in which a flat plate receives ink that is transferred to a paper. The plate is prepared with a hydrophobic media to receive greasy ink. Once dampened, the nonimage area repels the ink while the hydrophobic surface takes on the ink. Photomechanical examples include collotype, oil pigment print, oil pigment transfer print, photogravure, photolithograph.	French: planographique German: Flachdruck Spanish: planográfico/a
platinic, platinous	The names given to the element platinum when chemically combined in its two most common oxidation states of +4 and +2, respectively. Modern terminology uses “platinum(IV)” and “platinum(II).”	French: platinique platineux German: Platini/platino Spanish: platinico platinoso
platinotype	A siderotype process invented by William Willis Jr. in 1873 in which the photoproduct from exposure of ferric oxalate reduces potassium tetrachloroplatinate(II) to give a platinum image. “Platinotype” is the Platinotype Company’s proprietary brand name for this process, from which the generic term “platinotype” is derived.	French: platinotype German: Platinotypie Spanish: platinotipo
platinum image transfer	<i>See</i> autoplatingraphy.	French: transfert de l’image platine German: Platin-Bildübertragung Spanish: transferencia de imagen al platino
platinum-toned matte collodion	A photographic print in which silver particles dispersed in a collodion binder have been at least partly replaced with platinum particles.	French: tirage collodion mat avec virage platine German: platingetontes Mattkollodium (Papier) Spanish: colodión mate entonado al platino
postprocessing treatment	Any procedure carried out on a print after initial processing that is intended to alter the physical appearance or chemical nature of the print.	French: post-traitement German: Nachbearbeitungsbehandlung Spanish: tratamiento posprocesado
precipitate	An insoluble solid thrown down in a solution due to a chemical reaction between the soluble components.	French: précipité German: Niederschlag/Abscheidungsstoff Spanish: precipitado
print-out process (POP)	A photographic printing process in which the image appears during exposure to light, without the use of developing chemicals.	French: procédé à noircissement direct German: Auskopierverfahren Spanish: proceso de impresión directa
proton	A fundamental positively charged particle with a charge equal, but opposite in sign, to that of the electron. <i>See</i> hydrogen ion.	French: proton German: Proton Spanish: protón
Raman spectroscopy	An analytical technique that relies on the modulation of light scattered by the vibrations of molecules or ionic compounds, used to identify classes of compounds, such as oils, waxes, resins, and synthetic polymers, and particularly suited for identification of pigments and dyes. It is complementary to Fourier transform infrared spectroscopy.	French: spectroscopie Raman German: Raman-Spektroskopie Spanish: espectroscopía Raman
raw stock	Machine-made paper produced for photographs that consists of pure cellulose fiber, free of defects and without contaminants, such as metal particulates and bleach residues, that would interfere with image formation. It must also have excellent wet strength, be dimensionally stable, and have a closed surface.	French: matières premières German: Faserrohstoff Spanish: materia prima del papel

Term	Definition	Translations
reagent	A reactive chemical, usually dissolved in a solvent at a concentration suitable to perform a test or carry out a reaction.	French: réactif German: Reagenz Spanish: reactivo
redox reaction	A chemical reaction involving the transfer of electrons from one atom, molecule, or ion to another. Shortened from “reduction-oxidation.”	French: réaction d’oxydoréduction German: Redoxreaktion Spanish: reacción redox
reduction (chemistry)	In chemistry, the addition of electrons to an atom or molecule, in consequence of which it becomes more negatively charged (or less positively charged); a decrease in the oxidation state of an atom or ion. <i>Contrast with</i> oxidation.	French: réduction (chimie) German: Reduktion Spanish: reducción (química)
reduction (photography)	In photography, a process of diminishing the optical density of an image by dissolving away some of its substance. Such a process is usually a chemical oxidation (e.g., of silver metal).	French: réduction (photographie) German: Abschwächung Spanish: reducción (fotografía)
relative humidity (RH, %RH)	The ratio of the amount of water vapor present in the atmosphere to the amount that would be present if the same atmosphere were saturated at a specific temperature.	French: humidité relative (HR,% HR) German: relative Luftfeuchtigkeit Spanish: humedad relative (HR%)
relative molecular mass	The sum of the relative atomic masses of all the atoms making up the molecular formula of the substance. Also called “molecular weight” or “formula weight.”	French: masse moléculaire relative German: relative Molekularmasse Spanish: masa molecular relativa
relief print	A method of printmaking in which the raised portions of a plate receives ink that is transferred to paper. Examples include letterpress relief halftone and electrotype relief halftone.	French: impression en relief German: Hochdruck (Reliefdruck) Spanish: impresión en relieve
rosin	A mixture of acidic, resinous compounds of varying quality extracted from conifer wood, used with alum in the machine-sizing of paper.	French: colophane German: Harz Spanish: colofonia
rough	In papermaking, having a strongly textured surface made by pressing the pulp between highly textured felts and air-drying, without subsequent pressing or calendering.	French: Rugeux brut German: raues Papier Spanish: rugoso
Sabattier effect	A partial reversal of tones in a silver develop-out print achieved by flashing the print with light during development.	French: effet Sabattier German: Sabattier-Effekt Spanish: efecto Sabattier
salt	Any substance composed of cations and anions; an ionic compound. “Common” or “table” salt is sodium chloride, Na ⁺ Cl ⁻ .	French: sel German: Salz Spanish: sal
salted paper print	A print formed on paper sensitized with silver chloride, formed by first soaking in common salt solution (sodium chloride), drying, and then brushing over with excess silver nitrate solution.	French: tirage sur papier salé German: Salzpapierabzug (Salzdruck) Spanish: impresión de papel salado
Satista	The Platinotype Company’s proprietary brand name for a siderotype process patented in 1913 by William Willis Jr. that combines silver halide and siderotype platinum chemistry to produce a platinum-silver image.	French: Satista German: Satista Spanish: Satista
saturated solution	A solution that cannot contain any more solute at a specified temperature.	French: solution saturée German: gesättigte Lösung Spanish: solución saturada
scanning electron microprobe–energy dispersive x-ray spectrometry (SEM-EDX)	An analytical technique using the beam of electron microscope to excite the characteristic x-ray spectra of the elements present. <i>See also</i> energy dispersive x-ray spectrometry; scanning electron microscopy; x-ray fluorescence spectrometry.	French: microsonde électronique à balayage-spectrométrie de rayon X à dispersion d’énergie German: Rasterelektronenmikrosonde-energie-dispersive Röntgenspektrometrie Spanish: espectrometría de energía dispersiva de rayos X-microsonda

Term	Definition	Translations
scanning electron microscopy (SEM)	An analytical technique that produces an image of a sample's surface by bombarding it with an electron beam and detecting signals from the topography and composition of the sample.	French: microscopie électronique à balayage (SEM) German: Rasterelektronenmikroskopie Spanish: microscopía electrónica de barrido
sensitizer	The solution of light-sensitive chemicals that is applied to a paper or other surface to make a photographic printing material.	French: sensibilisateur German: Sensibilisator Spanish: sensibilizador
sensitizer stain	A discoloration, typically yellowing, in the highlights of a print compared with an unsensitized region of the paper. This stain results from incomplete clearing of the process chemistry and may not be visible in a newly made print but may darken over time.	French: tâches du sensibilisateur German: Sensibilisator-Verfärbung Spanish: mancha de sensibilizador
sensitometry	The assessment of photochemical response in a photographic material by exposure to a measured illumination for a given time, which is then compared with the measurement of the optical density of the image formed, according to specific exposure and processing conditions.	French: sensitométrie German: Sensitometrie Spanish: sensitometría
siderotype	Any photochemical printing method based on a photosensitive iron salt. <i>See</i> argentotype; chrysotype; cyanotype; kallitype; kelainotype; Palladiotype; platinotype.	French: siderotype German: Siderotypie Spanish: siderotipo
simulacrum	A representation of or substitution for something. In the context of this volume, simulacra are the sample photographic prints created expressly for testing and comparison with actual photographic prints of historic and/or artistic value. From the Latin "simulare."	French: simulacre German: Simulacrum Spanish: simulacro
size, sizing, sizing agent	A dispersion or emulsion used to treat paper or fabric to improve water resistance, increase strength and dimensional stability, and influence print quality. It may be applied internally during manufacture or externally to the surface.	French: produit d'encollage l'agent d'encollage German: Leim, Leimung, Leimungsmittel Spanish: apresto, encolante, agente encolante
solar enlarger	An optical device using a large condensing lens to gather the sun's light to project the image of a negative via a second lens onto photographic paper. A tracking device is needed to follow the sun's apparent motion over the lengthy exposures.	French: agrandisseur solaire German: Solar-Vergrößerer Sonnen-Vergrößerer Spanish: energía solar
solarization	A photographic phenomenon in which increasing exposure diminishes the optical density of the image; also called "bronzing," "double-tone," "reversal."	French: solarisation German: Solarisation Spanish: solarización
solid-phase micro-extraction (SPME)	A sampling technique in which a short fiber is coated with a polymer selected for its physical and/or chemical affinities for the material or materials of interest, used in conjunction with liquid or gas chromatography–mass spectrometry.	French: micro-extraction en phase solide German: Festphasen-Mikroextraktion Spanish: micro extracción en fase sólida
solubility	The maximum weight of the substance that will dissolve completely in a given volume of solvent at a specific temperature.	French: solubilité German: Löslichkeit Spanish: solubilidad
solute	The substance dissolved in a solvent to make a solution.	French: soluté German: gelöste Substanz, gelöster Stoff Spanish: soluto
solution	A homogeneous liquid composed of a solute dissolved in a solvent. <i>Contrast with</i> suspension.	French: solution German: Lösung Spanish: solución
solvent	A liquid capable of dissolving other substances (solid, liquid, or gaseous) to form solutions.	French: solvant German: Lösungsmittel Spanish: disolvente

Term	Definition	Translations
split-toning	The application of developers of different chemical compositions with separate brushes to achieve warm and cool tonalities in the same print.	French: virage sélectif German: Splittonung Spanish: entonado selectivo o dividido
standard resolution target	A reference containing several sets of maximum density parallel lines of varying lengths and thicknesses and text printed in different font sizes, used to calibrate microscopes or measure the resolving power of imaging systems.	French: cible de résolution standard German: Standardtafel für das Auflösungsvermögen Spanish: referente estándar de resolución
starch	A plant-derived complex carbohydrate added to paper as a filler or sizing agent.	French: amidon German: Stärke Spanish: almidón
step-tablet	A gray scale consisting of defined regions of uniformly increasing density typically used in photography to determine correct exposure and development times. Step-tablets are useful for comparative studies.	French: coin sensitométrique German: Graustufenkeil Spanish: tarjeta de grises
stop, f stop	One increment on a logarithmic exposure scale, also used to describe differences in optical density. In photography, one stop more is a doubling, and one stop less a halving of the exposure time.	French: ouverture de diaphragme géométrique German: Blendenzahl, F-Zahl Spanish: apertura
surfactant	An agent that greatly reduces the surface tension of a liquid (usually water), enhancing its ability to wet objects.	French: tensioactif German: Tensid Spanish: surfactant, tensoactivo
suspension	Small particles of an insoluble solid dispersed in a liquid or gel. <i>Contrast with emulsion; solution.</i>	French: suspension German: Suspension Spanish: suspensión
supersaturated	Containing more solute than is permitted by the equilibrium solubility. If scratched, jarred, or “seeded,” a supersaturated solution may rapidly crystallize or precipitate.	French: sursaturé German: übersättigt Spanish: sobresaturado
thin layer chromatography (TLC) plate	A rigid, nonporous support coated with a thin layer of porous, inert material, such as aluminum oxide, used to separate components of a liquid mixture as it wicks up through the porous layer.	French: chromatographie en couche mince (CCM)-plaque German: Dünnschichtchromatographie (DC)-Platte Spanish: placa de cromatografía de capa fina
time-of-flight secondary ion mass spectrometry (TOF-SIMS)	A surface-specific analytical technique that provides information about the elemental and molecular composition in the top 1–2 nanometers of a sample.	French: spectroscopie de masse d'ions secondaires à mesure de temps de vol (TOF-SIMS) German: Flugzeit-Sekundärionen-Massenspektrometrie Spanish: espectrometría de masas de iones
tinting	The use of organic materials to give an overall tone to paper. <i>See mellowing.</i>	French: colorer German: Färbung Spanish: entintado
toning	The application of a material with the primary intention to change the color of a finished print.	French: virage (photographie) German: Tönung Spanish: entonado
transmittance	The fraction or percentage of the intensity of the incident light that passes through an object: transmittance = intensity of transmitted light / intensity of incident light = I_t/I_o It is the reciprocal of the opacity, I_o/I_t .	French: transmittance German: Transmission Spanish: transmitancia
ultraviolet radiation (UV)	Electromagnetic radiation with wavelengths from 400 nm to about 50 nm, and thus of shorter wavelength and higher energy than visible light. Conventional divisions of the ultraviolet spectrum are: UVA 400–315 nm; UVB 315–280 nm; UVC 280–200 nm. The so-called “near-ultraviolet” UVA is the most suitable actinic radiation for siderotype processes.	French: le rayonnement ultraviolet (UV) German: ultraviolette Strahlung Spanish: radiación ultravioleta

Term	Definition	Translations
ultraviolet-visible spectroscopy (UV-Vis)	Analytical technique in which a sample is scanned with visible and ultraviolet light to create an absorbance or transmission spectrum.	French: spectroscopie ultraviolet-visible (UV-vis) German: Ultraviolett-sichtbare Spektroskopie Spanish: espectroscopía ultraviolet y visible
visible light	Electromagnetic radiation spanning the range between 400 nm (violet) and 780 nm (deep red).	French: rayonnement visible German: sichtbares Licht Spanish: luz visible
watermark	A mark imparted during the manufacture of the paper, generally used to identify the papermaker, paper format, surface, and/or date. True watermarks are created in handmade or cylinder-mold paper by a wire design or letters attached to the screen, which partially block settling of pulp during sheet formation.	French: filigrane German: Wasserzeichen Spanish: marca de agua
weight of paper	A measure of a paper sheet that relates to its thickness and density, in units of “weight per unit area,” e.g., grams per square meter, g/m ² (sometimes written as gsm). In the United States it is given as the weight in pounds of 500 sheets, which is an unspecified measure as it depends on sheet size.	French: grammage du papier German: Papiergewicht Spanish: peso o gramaje del papel
wove paper	Paper with uniform appearance in transmitted light. The name originates from the woven metal screen that collects the pulp during fabrication of the sheet, but it can also be used to describe machine-made paper that does not exhibit a laid pattern.	French: papier vélin German: Velinpapier Spanish: papel vitela/papel hecho a máquina
x-ray fluorescence spectrometry (XRF)	A nonsampling analytical technique in which x-rays strike a substance and displace electrons from their atomic orbitals. The characteristic x-rays then emitted by the sample are detected to identify its unique elemental composition.	French: spectrométrie de fluorescence des rayon-X (XRF) German: Röntgenfluoreszenzspektrometrie Spanish: espectrometría de fluorescencia de rayos X
x-ray photoelectron spectroscopy (XPS)	An analytical technique in which an x-ray interacts with the surface of a sample, and the energy and electrons given off are used to determine the elemental composition and electronic state of the elements in the substance.	French: spectroscopie de photoélectron X German: Röntgen-Photoelektronen-Spektroskopie Spanish: espectroscopía de fotoelectrón de rayos X
zeta potential	Electrical potential across the region of shear between a bulk solution and the molecules attracted closely to a surface.	French: potentiel zêta German: Zetapotential Spanish: potencial zeta

Note: German terms in parentheses indicate either an alternate, usually historic, term or spelling, or a brief explanatory note for German readers.

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CONVERSION OF OBSOLETE UNITS OF MEASUREMENT

Mike Ware

When interpreting historic formulations, it is advisable to convert all units of weight to grams (g) and all volumes to cubic centimeters (cc or cm³) or the equivalent milliliters (ml). Note that the volume measurement of 1 liter (1000 cc or ml) is referred to as a cubic decimeter (dm³) in the International System of Units (SI). The following conversions may be useful.

Weight

Apothecaries' measure was used by early physicians and scientists for weighing solids and making up formulas:

1 grain	(gr)	=		=	0.0648 g
1 scruple	(scr)	=	20 grains	=	1.296 g
1 drachm	(dr)	=	3 scruples (60 grains)	=	3.888 g
1 ounce	(oz)	=	8 drachms (480 grains)	=	31.104 g
1 pound	(lb)	=	12 ounces (5760 grains)	=	373.242 g

Troy weight has the same basis as apothecaries' measure—the grain—and was always used for weighing precious materials such as gold and silver metal:

1 grain Troy	=	1 grain apothecaries'	=	0.0648 g
1 pennyweight	=	24 grains	=	1.555 g
1 ounce	=	20 pennyweights (480 gr)	=	31.104 g
1 pound	=	12 ounces (5760 grains)	=	373.242 g

Avoirdupois measure was the common system for weighing and selling solids; it was adopted by the British Pharmacopoeia in 1864:

1 grain	=	1 grain apothecaries'	=	0.0648 g
1 ounce	=	437.5 grains	=	28.3495 g
1 pound	=	16 ounces (7000 gr)	=	453.592 g

The larger units in the avoirdupois system—stones, quarters, hundredweights, and tons—are omitted as irrelevant here. Texts do not always make clear which system the “ounces” (abbreviated “oz.”) in their formulas refer to, but they are more likely to be Avoirdupois, which was widely used by the 1850s, unless the substance was metallic gold or silver, when Troy ounces were appropriate. As a consequence of this ambiguity, an “ounce” of silver nitrate weighed less than an “ounce” of silver metal! Avoirdupois measure also defined a “dram” (usually so spelled to distinguish it from the apothecaries' measure drachm) of $\frac{1}{16}$ ounce.

Volume

British fluid measure was used for measuring volumes of liquids. The imperial pint of 20 fluid ounces replaced the ancient 16 ounce pint in 1826:

1 minim	=	(ca. 1 drop)	=	0.0592	cm ³
1 fluid drachm	=	60 minims	=	3.552	cm ³
1 fluid ounce	=	8 fluid drachms	=	28.413	cm ³
1 gill	=	5 fluid ounces	=	142.065	cm ³
1 pint	=	20 fluid ounces	=	568.261	cm ³
1 quart	=	2 pints	=	1136.522	cm ³
1 gallon	=	8 pints	=	4546.087	cm ³

1 fluid ounce of water weighs approximately 1 ounce avoirdupois.

Many nineteenth-century workers described their solution strengths in grains per fluid ounce:

$$\text{A concentration of 1 grain/fluid ounce} = 2.28 \text{ g/dm}^3 = 0.228\% \text{ w/v}$$

$$\text{A unit of volume occasionally used was the cubic inch} = 16.387 \text{ cm}^3$$

U.S. fluid measure differs from British liquid volume measurement in the size of its basic unit, the minim, and the United States system still retains a 16 ounce pint today:

1 minim (U.S.)	=		=	0.06161	cm ³
1 fluid dram (U.S.)	=	60 minims	=	3.697	cm ³
1 fluid ounce (U.S.)	=	8 fluid drams	=	29.574	cm ³
1 pint (U.S.)	=	16 fluid ounces	=	473.176	cm ³
1 quart (U.S.)	=	2 pints	=	946.352	cm ³
1 gallon (U.S.)	=	8 pints	=	3785.412	cm ³

Area

Paper area was quoted in square feet or square inches (1 ft² = 144 in²):

$$1 \text{ square foot (ft}^2\text{)} = 0.09290304 \text{ m}^2$$

$$1 \text{ square inch (in}^2\text{)} = 6.4516 \text{ cm}^2$$

So a coating weight of 1 grain/ft² = 0.6975 g/m².

Sarah S. Wagner

The extensive references that follow each essay in this volume serve as a comprehensive bibliography of the history, chemistry, materials, processes, and other issues pertaining to platinum and palladium prints and related processes. The following list provides useful sources for scholars as key aids in the study of these photographs.

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