

## Glossary of Terms

**Abaca** - Another name for manilla hemp (*Musa textilis*), a leaf fiber commonly cultivated in the Phillipines.

**Alkaline** - Alkaline substances also known as bases are those which have a pH value above 5 (6-11) on the pH scale. Chemically defined they are those substance which have a reduced amount of hydrogen ions..... Examples of common alkalis include caustic soda, lye, sodium carbonate, which is known as soda or washing soda in crystalline form. Baking soda (sodium bicarbonate) and trisodium phosphate are less alkaline as also is borax (sodium tetraborate) and gypsum.

**Alkaline reserve** - An alkaline paper additive such as calcium carbonate. Also called 'buffer'.

**Anisotropy** - The opposite of isotropy; Particles are said to be 'anisotropic' when they are visible against the black background obtained in the field of view when the analyzer on the microscope is pushed in. Azurite, cobalt blue, chalk white and lead white particles, for example, appeared light against the black background; these pigments can therefore be described as anisotropic.

**Base** - An inert compound, an alkaline or alkaline forming substance.

**Bast Fiber** - The inner bark or phloem of woody plants (dicotyleydons) which occur in the outer ring of vascular tissue. Bast fibers transplant aqueous solution from the leaves. The term is also used to refer to the fibers found in the cortex and pericycle rings of herbaceous plants. Mitsumata, kozo, gampi, hemp, flax and jute are all considered bast fibers.

**Becke Test**- A method of determining the refractive index of a particle through observing the direction on which the Becke line moves. A particle fiber mounted in a medium will exhibit a halo of light around its circumference when observed under reflected light on an normal incident light microscope. The halo will always move to the higher refractive index medium when the focus is raised (increased). The halo will go into the lower refractive index medium when the microscope is focused downward. (See Appendices for a more detailed description.)

**Conchoidal Fracture** - A type of fracture seen when a mineral or other substance, such as glass, breaks to give irregularly curved and usually striated surfaces.

**Covering Power** - The extent of area covered satisfactorily by a pigment, paint or varnish across a given area. The term is often expressed in square feet and is often confused with the term 'hiding power'.

**Dichroism** - The ability of a substance/ pigment to appear two different colours when viewed under different circumstances or , for instance, different lights. For example alizarin crimson can appear deep maroon in water colour but ruby-red in thin layers of paint and when viewed by transmitted light.

**Extinction** -     **Oblique**; If the vibration directions are oblique to the long direction of the crystal.  
                      **Parallel**; If the vibration directions are parallel or perpendicular to the long direction of the crystal.  
                      **Symmetrical**; If the vibration directions bisect a prominent angle.  
                      **(See Appendices for a diagram explanation!)**

**Fibrils**- Microscopic raised strands which protrude from the cell walls of cellulose and other fibers during beating. Their diameter depends upon how much mechanical treatment they have undergone.

## **Gouache;**

An opaque watercolour made by grinding pigments in the same medium as is used for watercolours but with a larger percentage of vehicle than is used in watercolour; and by adding various amounts of inert pigments such as chalk or blanc-fixe (to improve colour and textural effects).

Gouache colours sold in tubes, contain the same ingredients as transparent watercolours, but chalk is added to some of the duller pigments to brighten them. Gouache, watercolour, pastel, and India ink are frequently combined in painting.

Gouache was occasionally used in Medieval manuscript illumination, and for miniature painting in the 16<sup>th</sup> - 18<sup>th</sup> Centuries, although toward the end of this period its use was confined to emphasising highlights.

In the 18<sup>th</sup> Century, it was popular with Italian and Swiss watercolourists.

It has a potential to dull and is, as a result, more difficult to add gouache to watercolour successfully than it is to add transparent watercolour to a painting done predominantly in gouache.

**Hemicellulose** - Cell wall polysaccharides. They form a non-crystalline matrix which absorbs water, which helps swell the fibers and when drying tends to harden, due to its adhesive nature, as fiber and fibrils shrink.

**Hydrolysis**- A chemical reaction of a substance caused by the presence of water resulting in formation of a new substance and a salt.

**Herzberg Stain** - Also known as the zinc chloride stain needs to be used within a month of preparation.  
**Colour result;**

**Blue, blue-grey or purple** - chemically treated wood, straw, grass, jute or similar fibers.

**Brownish-red** - Cotton, linen, ramie, hemp, paper mulberry, manilla and other similar fibers. Sometimes wood fibers which have undergone partial chemical and partial physical treatment.

**Yellow, brownish-yellow or green** - Wood fibers which have undergone mechanical treatment alone or mechanical treatment followed by limited chemical treatment; Also straw, grass or jute fibers which have some or no chemical treatment.

## **Ink;**

A coloured liquid used for writing or printing. There are three categories: water insoluble inks, water soluble and printers inks. Water soluble is known as India ink, prepared from carbon and resinous medium which becomes water insoluble upon drying.

Writing ink is water soluble and not regarded as absolutely permanent because it has a tendency to fade in strong sunlight. It is made of tannic acid, ferric sulphate and blue or black dyes.

Chinese inks that are solid and solid in stick form are compounds of a carbon pigment bound by a water-soluble substance.

Printing ink is oil-based; Made by grinding lamp black very fine and mixing it with oil. Less oil is used in a relief or typographic ink than an intaglio ink to make it more viscous so that it will not run into the hollows.

**Isotropy** - The opposite of anisotropy; Particles are said to be 'isotropic' if they disappear in the field of view, becoming dark with the black background obtained when the analyzer on the microscope is pushed inward.

**Lake** - A pigment made by precipitating or developing a dyestuff on an inert pigment with the assistance of chemicals and other manufacturing aids, by a process comparable to the dyeing of textiles. All older pigments made by this method are still called lakes, but a few of the synthetic or organic pigments developed in the last forty years use the name. The inert pigment in a lake is called the base, alumina hydrate is the standard base for transparent lakes and blanc fixe is the base for pigments where an opacity is desired. Clay, chalk, gypsum, white earth, and various chromatic pigments have all been used as lake bases at one time or another. All lakes made from natural dyestuffs (except madder lakes) are insufficiently permanent for artist's paints. Similarly, most of the early lakes made from synthetic organic dyes are not sufficiently non-bleeding for use in oil

colours, even though the lightfastness of some of them has increased in recent years by the molybdenic and phosphotungstic processing methods.

The word lake may come from the Ancient Egyptians or Greeks, Roman recipes still survive for making paint pigments from natural dyestuffs such as kermes and Tyrian purple.

17<sup>th</sup> and 18<sup>th</sup> Century writers used the term 'lake' to mean transparent red lake, without specifying crimson lake, carmine lake or lac lake.

**Lightfast** - The ability of a pigment or substance to resist fading or decomposition to result in fading through exposure to light. Usually when applied to artists pigments it refers to pigments which are totally unaffected by the chemical process of photooxidation which affects many organic pigments readily fading them dramatically with exposure to the sun and/or even predominantly ultraviolet rays emitted by most light bulbs.

**Lignin** - The non-carbohydrate portion of most plant cell walls. Lignin gives strength and structure to the plant but it is an inherently acidic material and large proportions of it in paper leads to discolouration. It has also been suggested (Barrett, 'Japanese Papermaking') that lignin interferes with hydrogen bonding of fibers during papermaking leading to weakness in the paper.'

**Neri** - Term given to the viscous liquid binder added to the pulp vat. The word originating from the verb *nebaru* 'to become sticky or viscous'.

**Oxidation**- The chemical reaction of a substance with oxygen to form an oxide.

**Photomicrograph** - A photograph of a small area as viewed under a microscope. The extent of magnification depends upon the lens being used.

**Pigment**- A Natural or synthetic colouring matter which is mixed with a medium to form a paint. Natural pigments can be found in plants, minerals and clays whereas synthetics are man-made and usually formed through chemical reaction.

A solid material which, following grinding and being reduced to a powder, can be used with a binder as a paint or ink.

A pigment is soluble whereas a dye is not.

Many pigments are inorganic compounds such as ochres, siennas or umbers, iron oxides, chrome yellow, ultramarine and lamp black. (Lake colours are white pigments carrying precipitated organic dyestuff.)

Pigments are solids which by definition do not dissolve when mixed with a vehicle. A dye, on the other hand, will generally stain a vehicle.

Pigments which are chemically identical are grouped together under a Colour Index Generic name, even though they are different colours, e.g. raw sienna and burnt sienna.

The lightfastness of a pigment is dependant upon the amount and quality of light; length of exposure, extent of mixing with other colours etc. Lightfastness of specific pigments in specific conditions is rated on the Blue Wool Scale (British Standard 1006) by numbers 1-8, 8 being most lightfast.

**Pleochroism** - The term for a subtle colour change seen in some particles under the microscope as they are rotated on the stand when illuminated by transmitted plane polarised light. It may be necessary to focus on a number of particles as a few only may change colour.

**Polarized Light** - Light rays with one single propagation direction and a single vibrational direction. The vibrational direction is always perpendicular to the propagation direction. It is produced from ordinary light by reflection, by double refraction in a suitable crystal or by absorption with a suitable pleochroic substance.

(See 'Polarized Light and Crossed Polars' in section on How to Use a Microscope.)

**Raw Fiber** - Harvested, dried black, white or green bark from the tree or plant in the case of Eastern papers and flax cotton etc freshly cut prior to papermaking in terms of Western fibers.

**Refractive Index (n)** - The ratio of the velocity of light in a vacuum to the velocity of light in some medium. Refractive index generally increases with the atomic number of the constituent atoms. A higher density or high atomic number elements usually results in a high refractive index.

**Translucent** - Transmission of light so that the image-forming rays are irregularly refracted and reflected.

**Transparent** - Transmits visible light appearing clear such as glass.

**Washi** - Japanese term for paper where 'wa' means Japan and 'shi' means paper. The term is used today to refer to any Japanese paper, hand or machine-made, traditionally produced or not.

**Watercolour**- Pigment bound in a water-soluble medium

The technique of painting with pigments in a gum arabic solution, a work so produced; also, the paint used in this technique.

The gum acts as a binder, but the other ingredients in watercolour paint included a platcizer such as hydromel or sugar water, a glycerin to keep the paint moist, a wetting agent to obtain a uniform flow or paint on surfaces, and a preservative such as phenol.

Watercolours are characterised by a luminous transparency, although gouache is sometimes considered an opaque watercolour technique.

At the modern technique of transparent watercolour painting was developed in the late 18<sup>th</sup> and early 19<sup>th</sup> Century's

Watercolour paints were being made commercially by the late 1700s. They were at first hard, dry cakes embossed with the maker's trademark. Moist watercolours, obtained by adding glycerine and sold in pans, were introduced around 1835.

**White bark** - The inner bark used to make paper in Japanese papermaking yielding the best fibers and producing a naturally off-white soft cream paper. Lesser quality papers will combine inner and outer, 'black', bark in papermaking.

**Woodpulp** - Mechanically/ chemically and combined soft and hardwood fibers used in papermaking. Fiber length, hemicellulose and lignin content can vary dramatically as can the additives such as fillers, coating bleaches and whiteners that are often added into the pulp.