Table of Select Pigments

Smithsonian Data Labs

Pigment	Region of Utilization	Origin	Date of discovery | Period of Utilization	Imaging Techniques	
				UVL[1]	FCIR[2]
BLUES					
Azurite	Central and Western Europe, China, Japan, Mesoamerica	Mineral	Discovered by Ancient Egyptians. Used as a paint pigment as early as 2500 BC, but was not widely used in Egypt or the classical world due to the availability of the synthetic copper pigment, Egyptian blue. Artificially made starting in the 1600s. It was later replaced by Prussian blue in the beginning of the 1700s. An important pigment in European painting throughout the Middle Ages and Renaissance. Widely used in East Asia, especially in Central Chinese wall paintings and Japanese Ukiyo-e paintings.	No	Dark Blue
Egyptian Blue	Ancient Egypt, West Asia, Ancient Greece, Mesopotamia, Roman Empire, Central Europe	Synthetic *Considered to be the first synthetic pigment.*	Discovered in ancient Egypt and used until the end of the Roman era in Europe. Invention of the manufacturing process during the first dynasties of ancient Egypt, beginning about 3100 B.C.	No	Red
Indigo	China, India, Japan, Mesopotamia, Egypt, Britain, Mesoamerica, Peru, Iran, and West Africa	Vegetal (plant-based)	Discovered in ancient Egypt and used by ancient Greeks and Romans. Used from circa 3500 b.c. - 1900 (Synthetic indigo became commercially available in 1897, replacing natural indigo)	No	Red

[1] Ultraviolet-induced Visible Luminescence
[2] False Color Infrared

Prussian Blue	Europe, Asia. Later extended to the rest of the world.	Synthetic	Discovered in Germany around 1704. Available to artists by 1724 and has been very popular since its discovery.	No	Black
YELLOWS					
Cobalt Yellow	Europe, later extended to the rest of the world.	Synthetic	Thought to be discovered in Breslau, Poland in 1848. Introduced as a pigment in 1852, replacing Gamboge (an Asian yellow gum). It remained popular until the late 1800s when less expensive pigments like cadmiums were introduced. Still in use.	No	Blue
Indian Yellow	India, Europe	Animal	Discovered in the 1400s and used until 1883. The pigment was made from the urine of cows fed only mango leaves and water. However, this causes the cows to become extremely undernourished. In the early 1900s, laws prohibited the production of the pigment.	Orange-yellow	Pale Red
Orpiment	Ancient Egypt, Mesopotamia, India, Japan, China, Central Asia. Arrives to Venice during the Renaissance	Mineral & Synthetic	Discovered in ancient Egypt, used as early as 3100 B.C. until the end of the 1800s. No longer used because of its toxicity.	No	Pale White
REDS					
Cochineal	Mexico, later extended to Europe and Northern Africa	Insect	Used from the 1500s until the present. Made from cochineal beetles, native to the New World (mostly Central and South America). Used by Aztecs for dyeing and painting. Following the Spanish conquest in the 1500s, it was brought to Europe.	Dark Red	Orange
Red Lead	Byzantine Empire, Persia, Roman Empire; Later in Europe, China, and Central Asia	Synthetic *One of the earliest pigments to be artificially made.*	Used from the 1300s through the 1800s. Used by Byzantine and Persian illuminators and European manuscripts and paintings. No longer manufactured because of its toxicity.	Dark Red	Yellow-Brown

Vermilion	China, Ancient Greece, Roman Empire, Spain, Japan	Mineral & Synthetic	Discovered in ancient times and used until present, though scarcely due to its toxicity. Synthetic, discovered in the 700s and used until the 1800s. • Dry-process may have been invented by the Chinese around the early 1600s • Wet-process discovered in Germany in 1687 Used up until the discovery of cadmium red.	Dark Blue	Yellow
WHITES					
Lead white	Europe, Egypt, Greece, Rome, Indus Valley, China	Synthetic *One of the oldest synthetically produced pigments.*	Used as early as 400 BC. The most important white pigment, and the only white pigment used in European easel paintings until the 1800s. Manufacture was restricted in the 1800s due to lead being poisonous. Widely replaced by titanium dioxide in the 1900s.	Pale White	White
Shell white	Unique to Japan	Calcium Carbonate *Made of crushed seashells.*	Used in Japan since the 1400s and 1500s when it replaced clay as the common white pigment.	No	Not availabl e

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All chemical structures and names were taken from PubChem, except for the structure of calcium copper tetrasilicate (Egyptian Blue), which was taken from ChemTube 3D.