



NATURAL DYE RESEARCH and DEVELOPMENT LABORATORY  
“NATURAL ORGANIC LAKE PIGMENT SAMPLES”

Instructions for the Preparation of Natural Organic Lake Pigments

Dissolve natural organic bindings (such as carrageenan, gum arabic, gluten, starch, glue (powdered asphodel root) in water until it reaches thick consistency.

Add the selected pigment to this solution. Stir the pigment into the solution until it becomes consistent.

The pigments may also be used by dissolving them in water only.

**Code:** Ru000001  
DATU-made of madder roots, according to historical recipe.  
**Properties**  
**Chemical description:** Red lake pigment made from the madder plant (*Rubia tinctorum* L.). Obtained from the roots of the madder plant (*Rubia tinctorum* L.). Precipitated with alum.  
**Colour:** Light red.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 6 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:38.47 ; a\*:31.00 ; b\*: 15.76

**Code:** Ru000002  
DATU-made of madder roots, according to historical recipe.  
**Properties**  
**Chemical description:** Red lake pigment made from the madder plant (*Rubia tinctorum* L.). Obtained from the roots of the madder plant (*Rubia tinctorum* L.). Precipitated with alum.  
**Colour:** Red.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 6 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:32.27 ; a\*:29.06 ; b\*: 22.18

**Code:** Ru000003  
DATU-made of madder roots, according to historical recipe.  
**Properties**  
**Chemical description:** Red lake pigment made from the madder (*Rubia tinctorum* L.). Obtained from the roots of the madder plant (*Rubia tinctorum* L.). Precipitated with alum and calcium.  
**Colour:** light red.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache, Violin, Varnish /Wooden Surfaces,Restoration, miniature,calligraphy,marbling, fresco and painting  
**Lightfastness:** 6 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:47.15 ; a\*:34.22 ; b\*: 13.36

**Code:** Da000001  
DATU-made of cochineal insect,  
**Properties**  
**Chemical description:** Purple lake pigment made from cochineal insect (*Dactylopius coccus* Costa). Obtained from cochineal insect (*Dactylopius coccus* Costa). Precipitated with alum and calcium salt.  
**Colour:** Purple.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 7 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:15.72 ; a\*:16.43 ; b\*: -8.31

**Code:** Da000002  
DATU-made of cochineal insect,  
**Properties**  
**Chemical description:** Pink lake pigment made from the cochineal insect (*Dactylopius coccus* Costa). Obtained from cochineal insect (*Dactylopius coccus* Cost Precipitated with alum  
**Colour:** Pink  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 7 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:64.36 ; a\*:24.33 ; b\*: -10.40

**Code:** Da000003  
DATU-made of cochineal insect,  
**Properties**  
**Chemical description:** Pink lake pigment made frc the cochineal insect (*Dactylopius coccus* Cost; Obtained from cochineal insect (*Dactylopius coccus* Costa). Precipitated with alum.  
**Colour:** Light pink.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 6 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:72.70 ; a\*: 19.52 ; b\*: -9.69

**Code:** Da000004  
DATU-made of cochineal insect,  
**Properties**  
**Chemical description:** Violet lake pigment made from the cochineal insect (*Dactylopius coccus* Costa). Obtained from cochineal insect (*Dactylopius coccus* Costa). Precipitated with alum.  
**Colour:** Violet.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 6 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:28.10 ; a\*:25.78 ; b\*: -15.29

**Code:** Re000001  
DATU-made from weld plant, according to historical recipe.  
**Properties**  
**Chemical description:** Yellow lake pigment made from the weld plant (*Reseda luteola*). Obtained from weld plant (*Reseda luteola*). Precipitated with alum.  
**Colour:** Yellow.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 6 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:66.02 ; a\*:-0.39 ; b\*: 49.26

**Code:** Re000002  
DATU-made from weld plant, according to historical recipe.  
**Properties**  
**Chemical description:** Yellow lake pigment made from weld plant (*Reseda luteola*). Obtained from weld plant (*Reseda luteola*). Precipitated with alum.  
**Colour:** Yellow.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 6 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:75.37 ; a\*:-2.60 ; b\*: 48.93

**Code:** Re000003  
DATU-made from weld plant, according to historical recipe.  
**Properties**  
**Chemical description:** Yellow lake pigment made from the weld plant (*Reseda luteola*). Obtained from weld plant (*Reseda luteola*). Precipitated with alum.  
**Colour:** Lemon yellow.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 6 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:83.54 ; a\*:-4.12 ; b\*: 35.47

**Code:** Re000004  
DATU-made from weld plant, according to historical recipe.  
**Properties**  
**Chemical description:** Yellow lake pigment made from the weld plant (*Reseda luteola*). Obtained from weld plant (*Reseda luteola*). Precipitated with alum and calcium salt.  
**Colour:** Yellow.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 6 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:62.31 ; a\*:4.79 ; b\*: 38.81

**Code:** Rh000001  
DATU-made from Anatolian buckthorn, according to historical recipe.  
**Properties**  
**Chemical description:** Yellowish lake pigment made from Anatolian buckthorn plant (*Rhamnus petiolaris* Boiss). Obtained from fruits of the the Anatolian buckthorn plant (*Rhamnus petiolaris* Boiss). Precipitated with alum.  
**Colour:** Yellowish.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache, Violin, Varnish /Wooden Surfaces,Restoration, miniature,calligraphy,marbling, fresco and painting  
**Lightfastness:** 5 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:53.22 ; a\*:9.18 ; b\*: 51.08

**Code:** Rh000002  
DATU-made from Anatolian buckthorn, according to historical recipe.  
**Properties**  
**Chemical description:** Yellowish lake pigment made from Anatolian buckthorn plant (*Rhamnus petiolaris* Boiss). Obtained from fruits of the the Anatolian buckthorn plant (*Rhamnus petiolaris* Boiss). Precipitated with alum.  
**Colour:** Yellowish.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 5 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:47.75 ; a\*:11.75 ; b\*: 49.92

**Code:** Rh000003  
DATU-made from Anatolian buckthorn, according to historical recipe.  
**Properties**  
**Chemical description:** Yellow lake pigment made from Anatolian buckthorn plant (*Rhamnus petiolaris* Boiss). Obtained from the fruits of the Anatolian buckthorn plant (*Rhamnus petiolaris* Boiss). Precipitated with alum.  
**Colour:** Yellow  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 6 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:58.40 ; a\*:14.06 ; b\*: 64.19

**Code:** In000001  
DATU-Natural organic indigo.  
**Properties**  
**Chemical description:** Obtained from the leaves of the indig plant (*Indigofera tinctoria*).  
**Colour:** Blue.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 4 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:28.17 ; a\*:-2.71 ; b\*: 6.18

**Code:** In000002  
DATU-Natural organic indigo.  
**Properties**  
**Chemical description:** Obtained from the leaves of the indig plant (*Indigofera tinctoria*).  
**Colour:** Blue.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 4 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:18.24 ; a\*:1.19 ; b\*: -15.95

**Code:** Qs000001  
DATU-made from oak, according to historical recipe.  
**Properties**  
**Chemical description:** Brown lake pigment made from the oak plant (*Quercus ithaburensis*). Obtained from oak plant (*Quercus ithaburensis*). Precipitated with alum.  
**Colour:** brown  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 7 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:50.84 ; a\*:6.42 ; b\*: 26.13

**Code:** Qs000002  
DATU-made from oak, according to historical recipe.  
**Properties**  
**Chemical description:** Brown lake pigment made from the oak plant (*Quercus ithaburensis*). Obtained from oak plant (*Quercus ithaburensis*). Precipitated with alum.  
**Colour:** light brown.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 7 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:45.33 ; a\*:6.47 ; b\*: 23.77

**Code:** Qf000001  
DATU-made from gall oak, according to historical recipe.  
**Properties**  
**Chemical description:** Black lake pigment made from the oak plant (*Quercus infectoria*). Obtained from oak plant (*Quercus infectoria*). Precipitated with iron salt.  
**Colour:** Black.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 7 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:13.64 ; a\*:-0.21 ; b\*: -0.62

**Code:** InRh0001  
DATU-made from natural indigo and Anatolian buckthorn.  
**Properties**  
**Chemical description:** Dark green lake pigment made from the indig plant (*Indigofera tinctoria*) and Anatolian buckthorn (*Rhamnus petiolaris* Boiss). Obtained from the leaves of the indig plant (*Indigofera tinctoria*) and the fruits of the Anatolian buckthorn (*Rhamnus petiolaris* Boiss). Precipitated with alum.  
**Colour:** Dark green.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 5 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:34.90 ; a\*:2.40 ; b\*: 22.61

**Code:** InRhRe01  
DATU-made from natural indigo, Anatolian buckthorn and weld.  
**Properties**  
**Chemical description:** Green lake pigment made from the indig plant (*Indigofera tinctoria*), Anatolian buckthorn (*Rhamnus petiolaris* Boiss) and weld plant (*Reseda luteola*). Obtained from the leaves of the indig plant (*Indigofera tinctoria*) the fruits of the Anatolian buckthorn (*Rhamnus petiolaris* Boiss) and weld plant (*Reseda luteola*). Precipitated with alum and calcium salt.  
**Colour:** Green.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 5 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:49.40 ; a\*:-1.24 ; b\*: 25.83

**Code:** InDa0001  
DATU-made from natural indigo and cochineal insect.  
**Properties**  
**Chemical description:** Purple lake pigment made from the indig plant (*Indigofera tinctoria*) and cochineal insect (*Dactylopius coccus* Costa). Obtained from the leaves of the indig plant (*Indigofera tinctoria*) and cochineal insect (*Dactylopius coccus* Costa). Precipitated with alum and calcium salt.  
**Colour:** Purple.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 5 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:17.46 ; a\*:8.90 ; b\*: -12.73

**Code:** InRe0001  
DATU-made from natural indigo, weld and oak.  
**Properties**  
**Chemical description:** Light green lake pigment made from the indig plant (*Indigofera tinctoria*) and weld (*Reseda luteola*). Obtained from the leaves of the indig plant (*Indigofera tinctoria*) and weld plant (*Reseda luteola*). Precipitated with alum.  
**Colour:** Light green.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 5 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:65.45 ; a\*:-5.05 ; b\*: 39.87

**Code:** InRhDa01  
DATU-made from natural indigo, Anatolian buckthorn and cochineal.  
**Properties**  
**Chemical description:** Gray lake pigment made from indig plant (*Indigofera tinctoria*), Anatolian buckthorn and cochineal insect (*Dactylopius coccus* Costa). Obtained from the leaves of the indig plant (*Indigofera tinctoria*), the fruits of the Anatolian buckthorn plant (*Rhamnus petiolaris* Boiss) and cochineal insect (*Dactylopius coccus* Costa) . Precipitated with alum.  
**Colour:** Gray.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 5 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:39.74 ; a\*:1.55 ; b\*: 1.95

**Code:** ReRu0001  
DATU-made from weld and madder. According to historical recipe.  
**Properties**  
**Chemical description:** Orange lake pigment made from the weld plant (*Reseda luteola*) and madder roots (*Rubia tinctorum* L.). Obtained from weld (*Reseda luteola*) and madder roots (*Rubia tinctorum* L.). Precipitated with alum and calcium salt.  
**Colour:** Orange.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 5 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:49.23 ; a\*:16.55 ; b\*: 39.77

**Code:** ReRuDa01  
DATU-made from weld plant, madder roots and cochineal insect.  
**Properties**  
**Chemical description:** Somon color lake pigment made from the weld plant (*Reseda luteola*) , madder roots (*Rubia tinctorum* L.) and cochineal insect (*Dactylopius coccus* Costa). Obtained from weld (*Reseda luteola*), madder roots (*Rubia tinctorum* L.) and cochineal insect (*Dactylopius coccus* Costa). Precipitated with alum.  
**Colour:** Somon.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 5 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:56.97 ; a\*:17.60 ; b\*: 23.08

**Code:** ReRuRh01  
DATU-made from weld, madder and Anatolian buckthorn.  
**Properties**  
**Chemical description:** Orange lake pigment made from the weld plant (*Reseda luteola*), madder roots (*Rubia tinctorum* L.) and Anatolian buckthorn plant (*Rhamnus petiolaris* Boiss). Obtained from weld (*Reseda luteola*), madder roots (*Rubia tinctorum* L.) and the fruits of the Anatolian buckthorn (*Rhamnus petiolaris* Boiss). Precipitated with alum.  
**Colour:** Orange.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 5 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:59.24 ; a\*:14.26 ; b\*: 37.86

**Code:** RuRhQf01  
DATU-made from madder, Anatolian buckthorn and gall oak.  
**Properties**  
**Chemical description:** Brown lake pigment made from the madder plant (*Rubia tinctorum* L.) Anatolian buckthorn plant (*Rhamnus petiolaris* Boiss) and gall oak plant (*Quercus infectoria*). Obtained from madder roots (*Rubia tinctorum* L.), the leaves of the Anatolian buckthorn (*Rhamnus petiolaris* Boiss) and gall oak (*Quercus infectoria*). Precipitated with alum.  
**Colour:** Brown.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 5 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:29.15 ; a\*:14.53 ; b\*: 26.57

**Code:** RuDa0001  
DATU-made from madder roots and cochineal insect.  
**Properties**  
**Chemical description:** Dark pink lake pigment made from the madder plant (*Rubia tinctorum* L.) and cochineal insect (*Dactylopius coccus* Costa) . Obtained from madder roots (*Rubia tinctorum* L.) and cochineal insect (*Dactylopius coccus* Costa). Precipitated with alum and calcium salt.  
**Colour:** Dark pink.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 7 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:25.90 ; a\*:27.58 ; b\*: -2.22

**Code:** RhDa0001  
DATU-made from Anatolian buckthorn plant and cochineal insect.  
**Properties**  
**Chemical description:** Orange lake pigment made from the Anatolian buckthorn plant (*Rhamnus petiolaris* Boiss) and cochineal insect (*Dactylopius coccus* Costa). Obtained from the fruits of the Anatolian buckthorn (*Rhamnus petiolaris* Boiss) and cochineal insect (*Dactylopius coccus* Costa). Precipitated with alum.  
**Colour:** Orange.  
**Solubility:** Insoluble.  
**Suitability:** Oil, Acrylics, Tempera, Watercolor / Gouache,Varnish /Wooden Surfaces,Restoration Miniature,Calligraphy, Marbling,Fresco and painting  
**Lightfastness:** 5 (1 is poor, 8 is best).  
CIELAB Values:  
L\*:47.61 ; a\*:16.40 ; b\*: 33.62