# Cleaning of Acrylic Painted Surfaces

## Washington DC, April 30 – May 3, 2013

**TITLE**

**MCP Recipes**

**INSTRUCTOR**

**Chris Stavroudis**

**TECHNICAL NOTE**

Recipes found on next pages.



# Aqueous Component Mixing Directions

## pH 5.0 citric acid / sodium hydroxide (10%) concentrate

To make 100 mL of pH 5.0 citric acid / sodium hydroxide (10%) concentrate:
Measure 4.8 grams of citric acid in 77mL distilled water.
Adjust the pH to 5 by slowly adding approximately 14.95 mL or 16.6 grams of sodium hydroxide (10%) while stirring and monitoring the pH.
Bring the final volume to 100mL.


CONCENTRATE - do not use undiluted

**pH 5.0 citric acid / sodium hydroxide**

| | |
|---|---|
| 4.8g | citric acid |
| 14.95 mL | sodium hydroxide (10%) to adjust pH to 5 |
| 100 mL | final volume with distilled water |

Mixed: April 2013 by: CAPS-DC

## pH 5.5 citric acid / sodium hydroxide (10%) concentrate

To make 100 mL of pH 5.5 citric acid / sodium hydroxide (10%) concentrate:
Measure 4.8 grams of citric acid in 74mL distilled water.
Adjust the pH to 5.5 by slowly adding approximately 17.62 mL or 19.56 grams of sodium hydroxide (10%) while stirring and monitoring the pH.
Bring the final volume to 100mL.


CONCENTRATE - do not use undiluted

**pH 5.5 citric acid / sodium hydroxide**

| | |
|---|---|
| 4.8g | citric acid |
| 17.62 mL | sodium hydroxide (10%) to adjust pH to 5.5 |
| 100 mL | final volume with distilled water |

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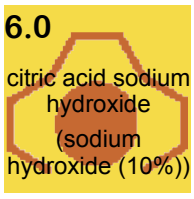
## pH 6.0 citric acid / sodium hydroxide (10%) concentrate

To make 100 mL of pH 6.0 citric acid / sodium hydroxide (10%) concentrate:
Measure 4.8 grams of citric acid in 72mL distilled water.
Adjust the pH to 6 by slowly adding approximately 20.14 mL or 22.36 grams of sodium hydroxide (10%) while stirring and monitoring the pH.
Bring the final volume to 100mL.




CONCENTRATE - do not use undiluted

**pH 6.0 citric acid / sodium hydroxide**

| | |
|---|---|
| 4.8g | citric acid |
| 20.14 mL | sodium hydroxide (10%) to adjust pH to 6 |
| 100 mL | final volume with distilled water |

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## pH 6.5 citric acid / sodium hydroxide (10%) concentrate

To make 100 mL of pH 6.5 citric acid / sodium hydroxide (10%) concentrate:
Measure 4.8 grams of citric acid in 69mL distilled water.
Adjust the pH to 6.5 by slowly adding approximately 22.92 mL or 25.44 grams of sodium hydroxide (10%) while stirring and monitoring the pH.
Bring the final volume to 100mL.


CONCENTRATE - do not use undiluted

**pH 6.5 citric acid / sodium hydroxide**

| | |
|---|---|
| 4.8g | citric acid |
| 22.92 mL | sodium hydroxide (10%) to adjust pH to 6.5 |
| 100 mL | final volume with distilled water |

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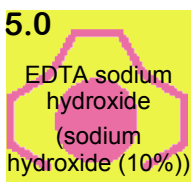
## pH 5.0 EDTA / sodium hydroxide (10%) concentrate

To make 100 mL of pH 5.0 EDTA / sodium hydroxide (10%) concentrate:
Measure 7.31 grams of EDTA in 69mL distilled water.
Adjust the pH to 5 by slowly adding approximately 18.56 mL or 20.6 grams of sodium hydroxide (10%) while stirring and monitoring the pH.
Bring the final volume to 100mL.




CONCENTRATE - do not use undiluted

**pH 5.0 EDTA / sodium hydroxide**

| | |
|---|---|
| 7.31g | EDTA |
| 18.56 mL | sodium hydroxide (10%) to adjust pH to 5 |
| 100 mL | final volume with distilled water |

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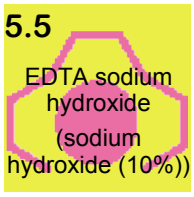
# Aqueous Component Mixing Directions

## pH 5.5 EDTA / sodium hydroxide (10%) concentrate

To make 100 mL of pH 5.5 EDTA / sodium hydroxide (10%) concentrate:
Measure 7.31 grams of EDTA in 68mL distilled water.
Adjust the pH to 5.5 by slowly adding approximately 19.64 mL or 21.8 grams of sodium hydroxide (10%) while stirring and monitoring the pH.
Bring the final volume to 100mL.




CONCENTRATE - do not use undiluted

**pH 5.5 EDTA / sodium hydroxide**

| | |
|---|---|
| 7.31g | EDTA |
| 19.64 mL | sodium hydroxide (10%) to adjust pH to 5.5 |
| 100 mL | final volume with distilled water |

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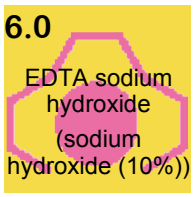
## pH 6.0 EDTA / sodium hydroxide (10%) concentrate

To make 100 mL of pH 6.0 EDTA / sodium hydroxide (10%) concentrate:
Measure 7.31 grams of EDTA in 66mL distilled water.
Adjust the pH to 6 by slowly adding approximately 21.69 mL or 24.08 grams of sodium hydroxide (10%) while stirring and monitoring the pH.
Bring the final volume to 100mL.




CONCENTRATE - do not use undiluted

**pH 6.0 EDTA / sodium hydroxide**

| | |
|---|---|
| 7.31g | EDTA |
| 21.69 mL | sodium hydroxide (10%) to adjust pH to 6 |
| 100 mL | final volume with distilled water |

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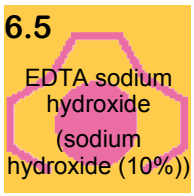
## pH 6.5 EDTA / sodium hydroxide (10%) concentrate

To make 100 mL of pH 6.5 EDTA / sodium hydroxide (10%) concentrate:
Measure 7.31 grams of EDTA in 63mL distilled water.
Adjust the pH to 6.5 by slowly adding approximately 24.22 mL or 26.88 grams of sodium hydroxide (10%) while stirring and monitoring the pH.
Bring the final volume to 100mL.




CONCENTRATE - do not use undiluted

**pH 6.5 EDTA / sodium hydroxide**

| | |
|---|---|
| 7.31g | EDTA |
| 24.22 mL | sodium hydroxide (10%) to adjust pH to 6.5 |
| 100 mL | final volume with distilled water |

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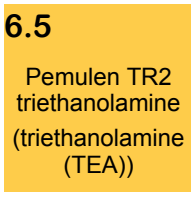
## 2% Pemulen TR2-TEA pH 6.5

To make 200mL of 2% Pemulen TR2-TEA pH 6.5:
Measure 4 grams of Pemulen TR2 in 100mL distilled water.
Mix to a smooth suspension allowing enough time for all the lumps to swell.
Dissolve 6.7 grams (6.0mL) of triethanolamine (TEA) into 95mL distilled water.
Mix the two components and stir well.
Check the pH by taking a very small amount of the gel concentrate and diluting it with distilled water. If the pH of the diluted gel is not correct, adjust the stock gel by adding




CONCENTRATE - do not use undiluted

**2% Pemulen TR2-TEA pH 6.5**

| | |
|---|---|
| 4g | Pemulen TR2 |
| 6.15 mL | triethanolamine (TEA) to adjust pH to 6.5 |
| 200 mL | final volume with distilled water |

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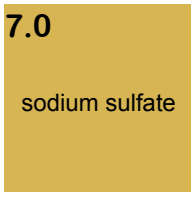
## Sodium sulfate anhydrous concentrate

To make 100 mL of Sodium sulfate anhydrous concentrate:
Measure 2.56 grams of Sodium sulfate anhydrous in 92mL distilled water.
Bring the final volume to 100mL.




CONCENTRATE - do not use undiluted

**Sodium sulfate anhydrous**

| | |
|---|---|
| 2.56g | Sodium sulfate anhydrous |
| 100 mL | final volume with distilled water |

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# Aqueous Component Mixing Directions

## polyethylene glycol (PEG) concentrate

To make 100 mL of polyethylene glycol (PEG) concentrate:
Measure 21.88 grams of polyethylene glycol (PEG) in 73mL distilled water.
Bring the final volume to 100mL.

CONCENTRATE - do not use undiluted

**polyethylene glycol (PEG)**

| | | |
|---|---|---|
| polyethylene glycol | 21.88g | polyethylene glycol (PEG) |
| | 100 mL | final volume with distilled water |

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## pH 5.0 acetic acid (glacial) / sodium hydroxide (10%) pH buffer concentrate

To make 100 mL of pH 5.0 acetic acid (glacial) / sodium hydroxide (10%) pH buffer concentrate:
Measure 1.5 grams (1.44 mL) of acetic acid (glacial) in 88mL distilled water.
Adjust the pH to 5 by slowly adding approximately 5.73 mL or 6.36 grams of sodium hydroxide (10%) while stirring and monitoring the pH.
Bring the final volume to 100mL.

CONCENTRATE - do not use undiluted

**5.0**

acetic acid
sodium hydroxide
(sodium hydroxide (10%))

**pH 5.0 acetic acid (glacial) / sodium**

| | |
|---|---|
| 1.44 mL | acetic acid (glacial) |
| 5.73 mL | sodium hydroxide (10%) to adjust pH to 5 |
| 100 mL | final volume with distilled water |

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## pH 5.5 MES / sodium hydroxide (10%) pH buffer concentrate

To make 100 mL of pH 5.5 MES / sodium hydroxide (10%) pH buffer concentrate:
Measure 5.33 grams of MES in 88mL distilled water.
Adjust the pH to 5.5 by slowly adding approximately 1.3 mL or 1.44 grams of sodium hydroxide (10%) while stirring and monitoring the pH.
Bring the final volume to 100mL.

CONCENTRATE - do not use undiluted

**5.5**

MES sodium hydroxide
(sodium hydroxide (10%))

**pH 5.5 MES / sodium hydroxide**

| | |
|---|---|
| 5.33g | MES |
| 1.3 mL | sodium hydroxide (10%) to adjust pH to 5.5 |
| 100 mL | final volume with distilled water |

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## pH 6.0 MES / sodium hydroxide (10%) pH buffer concentrate

To make 100 mL of pH 6.0 MES / sodium hydroxide (10%) pH buffer concentrate:
Measure 5.33 grams of MES in 87mL distilled water.
Adjust the pH to 6 by slowly adding approximately 3.14 mL or 3.48 grams of sodium hydroxide (10%) while stirring and monitoring the pH.
Bring the final volume to 100mL.

CONCENTRATE - do not use undiluted

**6.0**

MES sodium hydroxide
(sodium hydroxide (10%))

**pH 6.0 MES / sodium hydroxide**

| | |
|---|---|
| 5.33g | MES |
| 3.14 mL | sodium hydroxide (10%) to adjust pH to 6 |
| 100 mL | final volume with distilled water |

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## pH 6.5 Bis-tris / hydrochloric acid (10%) pH buffer concentrate

To make 100 mL of pH 6.5 Bis-tris / hydrochloric acid (10%) pH buffer concentrate:
Measure 5.23 grams of Bis-tris in 79mL distilled water.
Adjust the pH to 6.5 by slowly adding approximately 10.32 mL or 10.5 grams of hydrochloric acid (10%) while stirring and monitoring the pH.
Bring the final volume to 100mL.

CONCENTRATE - do not use undiluted

**6.5**

Bis-tris hydrochloric acid
(hydrochloric acid (10%))

**pH 6.5 Bis-tris / hydrochloric acid**

| | |
|---|---|
| 5.23g | Bis-tris |
| 10.32 mL | hydrochloric acid (10%) to adjust pH to 6.5 |
| 100 mL | final volume with distilled water |

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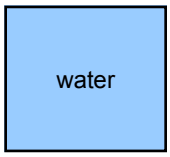
# Aqueous Component Mixing Directions

## water

To make 100 mL of water:
Measure 100 grams (100.18 mL) of water in -5mL distilled water.
Bring the final volume to 100mL.




**water**

100.18 mL water

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## 6000µS pH 5.0 adjusted water (ammonium acetate)

To make 125 mL of 6000µS pH 5.0 adjusted water (ammonium acetate):
Measure 1mL of acetic acid (glacial) in 100mL distilled water.
Adjust the pH to 5 by slowly adding approximately 7.8 mL of ammonium hydroxide (10%) while stirring and monitoring the pH.
Dilute the solution with distilled water until the conductivity is 6000µS. If you don't have a conductivity meter, bring the final volume to 125mL.

**5.0**
acetic acid
ammonium hydroxide
(ammonium hydroxide (10%))

**6000µS pH 5.0 adjusted water**

| | |
|---|---|
| 1 mL | acetic acid (glacial) |
| 7.78 mL | ammonium hydroxide (10%) to adjust pH to 5 |
| 125 mL | final volume with distilled water |

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## 6000µS pH 5.5 adjusted water (ammonium acetate)

To make 160mL of 6000µS pH 5.5 adjusted water (ammonium acetate):
Measure 1mL of acetic acid (glacial) in 100mL distilled water.
Adjust the pH to 5.5 by slowly adding approximately 10mL of ammonium hydroxide (10%) while stirring and monitoring the pH.
Dilute the solution with distilled water until the conductivity is 6000µS. If you don't have a conductivity meter, bring the final volume to 160mL.

**5.5**
acetic acid
ammonium hydroxide
(ammonium hydroxide (10%))

**6000µS pH 5.5 adjusted water**

| | |
|---|---|
| 1 mL | acetic acid (glacial) |
| 10.3 mL | ammonium hydroxide (10%) to adjust pH to 5.5 |
| 160 mL | final volume with distilled water |

Mixed: April 2013 by: CAPS-DC

## 6000µS pH 6.0 adjusted water (ammonium acetate)

To make approximately 170 mL of 6000µS pH 6.0 adjusted water (ammonium acetate):
Measure 1 mL of acetic acid (glacial) in 100mL distilled water.
Adjust the pH to 6.0 by slowly adding approximately 11.5mL of ammonium hydroxide (10%) while stirring and monitoring the pH.
Dilute the solution with distilled water until the conductivity is 6000µS. If you don't have a conductivity meter, bring the final volume to 170mL.

**6.0**
acetic acid
ammonium hydroxide
(ammonium hydroxide (10%))

**6000µS pH 6.0 adjusted water**

| | |
|---|---|
| 1 mL | acetic acid (glacial) |
| 11.56 mL | ammonium hydroxide (10%) to adjust pH to 6 |
| 170 mL | final volume with distilled water |

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## 6000µS pH 6.5 adjusted water (ammonium acetate)

To make approximately 175mL of 6000µS pH 6.5 adjusted water (ammonium acetate):
Measure 1 mL of acetic acid (glacial) in 100mL distilled water.
Adjust the pH to 6.5 by slowly adding approximately 12mL of ammonium hydroxide (10%) while stirring and monitoring the pH.
Dilute the solution with distilled water until the conductivity is 6000µS. If you don't have a conductivity meter, bring the final volume to 175mL.

**6.5**
acetic acid
ammonium hydroxide
(ammonium hydroxide (10%))

**6000µS pH 6.5 adjusted water**

| | |
|---|---|
| 1 mL | acetic acid (glacial) |
| 11.98 mL | ammonium hydroxide (10%) to adjust pH to 6.5 |
| 175 mL | final volume with distilled water |

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# Aqueous Component Mixing Directions

## Ecosurf™ EH-6 concentrate

To make 100 mL of Ecosurf™ EH-6 concentrate:
Measure 2.25 grams (2.25 mL) of Ecosurf™ EH-6 in 93mL distilled water.
Bring the final volume to 100mL.

CONCENTRATE - do not use undiluted

**Ecosurf™ EH-6 concentrate**

| | | |
|---|---|---|
| | 2.25 mL | Ecosurf™ EH-6 |
| Ecosurf™ EH-6 | 100 mL | final volume with distilled water |

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## Ethofat 242/25 concentrate

To make 100 mL of Ethofat 242/25 concentrate:
Measure 10.02 grams (9.27 mL) of Ethofat 242/25 in 86mL distilled water.
Bring the final volume to 100mL.


CONCENTRATE - do not use undiluted

**Ethofat 242/25 concentrate**

| | | |
|---|---|---|
| | 9.27 mL | Ethofat 242/25 |
| | 100 mL | final volume with distilled water |

Mixed: April 2013 by: CAPS-DC

## Ecosurf™ EH-9 concentrate

To make 100 mL of Ecosurf™ EH-9 concentrate:
Measure 2.73 grams (2.67 mL) of Ecosurf™ EH-9 in 92mL distilled water.
Bring the final volume to 100mL.

CONCENTRATE - do not use undiluted

**Ecosurf™ EH-9 concentrate**

| | | |
|---|---|---|
| | 2.67 mL | Ecosurf™ EH-9 |
| Ecosurf™ EH-9 | 100 mL | final volume with distilled water |

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## Triton XL-80N concentrate

To make 100 mL of Triton XL-80N concentrate:
Measure .44 grams (.45 mL ~ 16 drops) of Triton XL-80N in 95mL distilled water.
Bring the final volume to 100mL.


CONCENTRATE - do not use undiluted

**Triton XL-80N concentrate**

| | | |
|---|---|---|
| | .45 mL | Triton XL-80N |
| | 100 mL | final volume with distilled water |

Mixed: April 2013 by: CAPS-DC

## Brij® S-100 concentrate

To make 100 mL of Brij® S-100 concentrate:
Measure .47 grams of Brij® S-100 in 95mL distilled water.
Bring the final volume to 100mL.


CONCENTRATE - do not use undiluted

**Brij® S-100 concentrate**

| | | |
|---|---|---|
| | .47g | Brij® S-100 |
| | 100 mL | final volume with distilled water |

Mixed: April 2013 by: CAPS-DC

# Aqueous Component Mixing Directions

## Pluronic F127 concentrate

To make 100 mL of Pluronic F127 concentrate:
Measure 2.52 grams of Pluronic F127 in 93mL distilled water.
Bring the final volume to 100mL.

CONCENTRATE - do not use undiluted

**Pluronic F127 concentrate**

| | | |
|---|---|---|
| Pluronic F127 | 2.52g | Pluronic F127 |
| | 100 mL | final volume with distilled water |

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## Maypon 4C concentrate

To make 100 mL of Maypon 4C concentrate:
Measure 15 mL or 15.9 grams of Maypon 4C in 80mL distilled water.
Bring the final volume to 100mL.

CONCENTRATE - do not use undiluted

**Maypon 4C concentrate**

| | | |
|---|---|---|
| Maypon potassium hydroxide (potassium hydroxide (pellets)) | 15 mL | Maypon 4C |
| | 100 mL | final volume with distilled water |

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