

Cleaning of Acrylic Painted Surfaces

July 12 – 15, 2016

The John and Mable Ringling Museum of Art
Sarasota, Florida

SESSION TITLE: MCP Recipes

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Recipes found on next pages.



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The Ringling

THE JOHN & MABLE RINGLING
MUSEUM OF ART

STATE ART MUSEUM OF FLORIDA | FLORIDA STATE UNIVERSITY

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
100 mL final volume with distilled water

Mixed: June 2016 by: CAI

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.

5.0
acetic acid
sodium hydroxide
(sodium hydroxide (10%))

CONCENTRATE - do not use undiluted

pH 5.0 acetic acid (glacial) / sodium hydroxide (10%)
1.44 mL acetic acid (glacial)
5.73 mL sodium hydroxide (10%) to adjust pH to 5
100 mL final volume with distilled water

Mixed: June 2016 by: CAI

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.

5.5
MES sodium hydroxide
(sodium hydroxide (10%))

CONCENTRATE - do not use undiluted

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

Mixed: June 2016 by: CAI

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.

6.0
MES sodium hydroxide
(sodium hydroxide (10%))

CONCENTRATE - do not use undiluted

pH 6.0 MES / sodium hydroxide (10%)
5.33g MES
3.14 mL sodium hydroxide (10%) to adjust pH to 6
100 mL final volume with distilled water

Mixed: June 2016 by: CAI

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.

6.5
Bis-tris hydrochloric acid
(hydrochloric acid (10%))

CONCENTRATE - do not use undiluted

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

Mixed: June 2016 by: CAI

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.

5.0

citric acid sodium hydroxide (sodium hydroxide (10%))

CONCENTRATE - do not use undiluted

pH 5.0 citric acid / sodium hydroxide

4.8g citric acid
14.95 mL sodium hydroxide (10%)
100 mL final volume with distilled water

Mixed: June 2016 by: CAI

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.

5.5

citric acid sodium hydroxide (sodium hydroxide (10%))

CONCENTRATE - do not use undiluted

pH 5.5 citric acid / sodium hydroxide

4.8g citric acid
17.62 mL sodium hydroxide (10%)
100 mL final volume with distilled water

Mixed: June 2016 by: CAI

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.

6.0

citric acid sodium hydroxide (sodium hydroxide (10%))

CONCENTRATE - do not use undiluted

pH 6.0 citric acid / sodium hydroxide

4.8g citric acid
20.14 mL sodium hydroxide (10%)
100 mL final volume with distilled water

Mixed: June 2016 by: CAI

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.

6.5

citric acid sodium hydroxide (sodium hydroxide (10%))

CONCENTRATE - do not use undiluted

pH 6.5 citric acid / sodium hydroxide

4.8g citric acid
22.92 mL sodium hydroxide (10%)
100 mL final volume with distilled water

Mixed: June 2016 by: CAI

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.

5.0

EDTA sodium hydroxide (sodium hydroxide (10%))

CONCENTRATE - do not use undiluted

pH 5.0 EDTA / sodium hydroxide

7.31g EDTA
18.56 mL sodium hydroxide (10%)
100 mL final volume with distilled water

Mixed: June 2016 by: CAI

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.

5.5

EDTA sodium hydroxide (sodium hydroxide (10%))

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

Mixed: June 2016 by: CAI

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.

6.0

EDTA sodium hydroxide (sodium hydroxide (10%))

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

Mixed: June 2016 by: CAI

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.

6.5

EDTA sodium hydroxide (sodium hydroxide (10%))

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

Mixed: June 2016 by: CAI

pH 5.0 DTPA / sodium hydroxide (10%) concentrate

To make 100 mL of pH 5.0 DTPA / sodium hydroxide (10%) concentrate:

Measure 9.83 grams of DTPA in 59mL distilled water. Adjust the pH to 5 by slowly adding approximately 25.87 mL or 28.72 grams of sodium hydroxide (10%) while stirring and monitoring the pH.

Bring the final volume to 100mL.

5.0

DTPA sodium hydroxide (sodium hydroxide (10%))

CONCENTRATE - do not use undiluted

pH 5.0 DTPA / sodium hydroxide

9.83g	DTPA
25.87 mL	sodium hydroxide (10%) to adjust pH to 5
100 mL	final volume with distilled water

Mixed: June 2016 by: CAI

pH 5.5 DTPA / sodium hydroxide (10%) concentrate

To make 100 mL of pH 5.5 DTPA / sodium hydroxide (10%) concentrate:

Measure 9.83 grams of DTPA in 59mL distilled water. Adjust the pH to 5.5 by slowly adding approximately 26.63 mL or 29.56 grams of sodium hydroxide (10%) while stirring and monitoring the pH.

Bring the final volume to 100mL.

5.5

DTPA sodium hydroxide (sodium hydroxide (10%))

CONCENTRATE - do not use undiluted

pH 5.5 DTPA / sodium hydroxide

9.83g	DTPA
26.63 mL	sodium hydroxide (10%) to adjust pH to 5.5
100 mL	final volume with distilled water

Mixed: June 2016 by: CAI

Aqueous Component Mixing Directions

pH 6.0 DTPA / sodium hydroxide (10%) concentrate

To make 100 mL of pH 6.0 DTPA / sodium hydroxide (10%) concentrate:

Measure 9.83 grams of DTPA in 58mL distilled water. Adjust the pH to 6 by slowly adding approximately 26.95 mL or 29.92 grams of sodium hydroxide (10%) while stirring and monitoring the pH.

Bring the final volume to 100mL.

6.0

DTPA sodium hydroxide (sodium hydroxide (10%))

CONCENTRATE - do not use undiluted

pH 6.0 DTPA / sodium hydroxide

9.83g	DTPA
26.95 mL	sodium hydroxide (10%) to adjust pH to 6
100 mL	final volume with distilled water

Mixed: June 2016 by: CAI

pH 6.5 DTPA / sodium hydroxide (10%) concentrate

To make 100 mL of pH 6.5 DTPA / sodium hydroxide (10%) concentrate:

Measure 9.83 grams of DTPA in 58mL distilled water. Adjust the pH to 6.5 by slowly adding approximately 27.14 mL or 30.12 grams of sodium hydroxide (10%) while stirring and monitoring the pH.

Bring the final volume to 100mL.

6.5

DTPA sodium hydroxide (sodium hydroxide (10%))

CONCENTRATE - do not use undiluted

pH 6.5 DTPA / sodium hydroxide

9.83g	DTPA
27.14 mL	sodium hydroxide (10%) to adjust pH to 6.5
100 mL	final volume with distilled water

Mixed: June 2016 by: CAI

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
100 mL	final volume with distilled water

Mixed: June 2016 by: CAI

Ecosurf™ EH-9 concentrate

To make 100 mL of Ecosurf™ EH-9 concentrate:

Measure 2.67 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
100 mL	final volume with distilled water

Mixed: June 2016 by: CAI

Surfonic JL-80X concentrate

To make 100 mL of Surfonic JL-80X concentrate:

Measure .42 grams (.42 mL ~ 15 drops) of Surfonic JL-80X in 95mL distilled water.

Bring the final volume to 100mL.

CONCENTRATE - do not use undiluted

Surfonic JL-80X concentrate

.42 mL	Surfonic JL-80X
100 mL	final volume with distilled water

Mixed: June 2016 by: CAI

Aqueous Component Mixing Directions

Marlipal 1618/25 concentrate

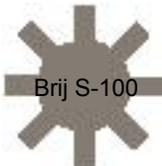
To make 100 mL of Marlipal 1618/25 concentrate:
Measure .32 grams of Marlipal 1618/25 in 95mL distilled water.
Bring the final volume to 100mL.

CONCENTRATE - do not use undiluted		
Marlipal 1618/25 concentrate		
Marlipal 1618/25	.32g 100 mL	Marlipal 1618/25 final volume with distilled water

Mixed: June 2016 by: CAI

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

Mixed: June 2016 by: CAI

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 100 mL	Pluronic F127 final volume with distilled water

Mixed: June 2016 by: CAI

Xanthan gum gel concentrate

To make 100 mL of Xanthan gum gel concentrate:
Add 7.47 grams of Xanthan gum to 20mL distilled water.
work into a smooth slurry and add 80mL distilled water to
bring the final volume to 100mL.

CONCENTRATE - do not use undiluted		
Xanthan gum gel concentrate		
Xanthan gum	7.47g 100 mL	Xanthan gum final volume with distilled water

Mixed: June 2016 by: CAI

Pemulen TR2-TEA pH 6.0 gel concentrate

The 5 times concentrated Pemulen stock gel is not practical to use and is listed more as a concept rather than an actual test mixture.
However a 5 grams(mL) of 2% Pemulen 6.0 stock gel can be mixed with 2 mL aliquots of aqueous MCP concentrate solutions.

CONCENTRATE - do not use undiluted		
6.0	Pemulen TR2-TEA pH 6.0 gel	
Pemulen TR2 triethanolamine (TEA))	5g 4 mL 100 mL	Pemulen TR2 triethanolamine (TEA) to adjust pH to 6 final volume with distilled water

Mixed: June 2016 by: CAI

Aqueous Component Mixing Directions

Pemulen TR2-TEA pH 6.5 gel concentrate

The 5 times concentrated Pemulen stock gel is not practical to use and is listed more as a concept rather than an actual test mixture.

However a 5 grams(mL) of 2% Pemulen 6.5 stock gel can be mixed with 2 mL aliquots of aqueous MCP concentrate solutions.

6.5

Pemulen TR2
triethanolamine
(triethanolamine
(TEA))

5g
4.45 mL
100 mL

CONCENTRATE - do not use undiluted

Pemulen TR2-TEA pH 6.5 gel

Pemulen TR2
triethanolamine (TEA) to adjust pH to 6.5
final volume with distilled water

Mixed: June 2016 by: CAI

Sodium Sulfate Ionic Buffer concentrate

To make 100 mL of Sodium Sulfate Ionic Buffer concentrate: Measure 2.56 grams of sodium sulfate anhydrous in 92mL distilled water.

Bring the final volume to 100mL.

7.0

sodium sulfate

2.56g
100 mL

CONCENTRATE - do not use undiluted

Sodium Sulfate Ionic Buffer

sodium sulfate anhydrous
final volume with distilled water

Mixed: June 2016 by: CAI

6000 μ S pH 5.0 adjusted water (ammonium acetate)

To make 125 mL of 6000 μ S 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 6000 μ S. If you don't have a conductivity meter, bring the final volume to 125mL.

5.0

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

1 mL
7.78 mL
125 mL

6000 μ S pH 5.0 adjusted water

acetic acid (glacial)
ammonium hydroxide (10%) to adjust pH to 5
final volume with distilled water

Mixed: June 2016 by: CAI

6000 μ S pH 5.5 adjusted water (ammonium acetate)

To make 160mL of 6000 μ S 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 6000 μ S. If you don't have a conductivity meter, bring the final volume to 160mL.

5.5

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

1 mL
10.3 mL
160 mL

6000 μ S pH 5.5 adjusted water

acetic acid (glacial)
ammonium hydroxide (10%) to adjust pH to 5.5
final volume with distilled water

Mixed: June 2016 by: CAI

6000 μ S pH 6.0 adjusted water (ammonium acetate)

To make approximately 170 mL of 6000 μ S 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 6000 μ S. If you don't have a conductivity meter, bring the final volume to 170mL.

6.0

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

1 mL
11.56 mL
170 mL

6000 μ S pH 6.0 adjusted water

acetic acid (glacial)
ammonium hydroxide (10%) to adjust pH to 6
final volume with distilled water

Mixed: June 2016 by: CAI

Aqueous Component Mixing Directions

6000 μ S pH 6.5 adjusted water (ammonium acetate)

To make approximately 175mL of 6000 μ S 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 6000 μ S. If you don't have a conductivity meter, bring the final volume to 175mL.

6.5

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

1 mL

11.98 mL

175 mL

6000 μ S pH 6.5 adjusted water

acetic acid (glacial)

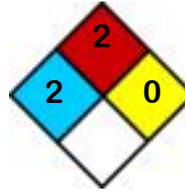
ammonium hydroxide (10%) to adjust pH to 6.5

final volume with distilled water

Mixed: June 2016 by: CAI

benzyl alcohol

100% benzyl alcohol



WARNING

benzyl alcohol

**WARNING! HARMFUL IF SWALLOWED
INHALED OR ABSORBED THROUGH
SKIN.**

CAUSES IRRITATION TO SKIN, EYES

**AND
RESPIRATORY TRACT. AFFECTS**

Mixed: June 2016 by: CAI