

APPENDIX

3

RECIPES FOR TLC STAINS

Staining solutions are ideally stored in 100mL wide-mouth jars covered with aluminum foil, a watch glass, or a screw cap to minimize evaporation.

A3.1 GENERAL STAINS

Phosphomolybdic Acid (PMA): Dissolve 10 g of phosphomolybdic acid in 100mL of absolute ethanol.

Potassium Permanganate: Dissolve 1.5 g of KMnO_4 , 10 g of K_2CO_3 , and 1.25 mL of 10% NaOH in 200mL of water.

Vanillin: Dissolve 15 g of vanillin in 250mL of ethanol and add 2.5 mL of conc. sulfuric acid.

***p*-Anisaldehyde A:** To 135mL of absolute ethanol add 5 mL of conc. sulfuric acid and 1.5 mL of glacial acetic acid. Allow the solution to cool to room temperature. Add 3.7 mL of *p*-anisaldehyde. Stir the solution vigorously to ensure homogeneity. Store refrigerated.

***p*-Anisaldehyde B:** Prepare a solution of anisaldehyde: HClO_4 :acetone:water in the proportions 1:10:20:80.

***p*-Anisaldehyde C:** Dissolve 2.5 mL of conc. sulfuric acid and 15 mL of *p*-anisaldehyde in 250mL of 95% ethanol.

Cerium Molybdate (Hanessian's Stain): To 235 mL of distilled water add 12 g of ammonium molybdate, 0.5 g of ceric ammonium molybdate, and 15 mL of conc. sulfuric acid. Wrap the jar with aluminum foil as the stain may be somewhat photo-sensitive.

A3.2 SPECIALIZED STAINS

Dinitrophenylhydrazine (DNP): Dissolve 12 g of 2,4-dinitrophenylhydrazine, 60 mL of conc. sulfuric acid, and 80 mL of water in 200 mL of 95% ethanol.

Ninhydrin: Dissolve 0.3 to 1.5 g of ninhydrin in 100 mL of *n*-butanol. Then add 3.0 mL of acetic acid.

Bromocresol Green: Dissolve 0.04 g of bromocresol green in 100 mL of absolute ethanol, which should give a colorless solution. Add a 0.1 M solution of aqueous NaOH dropwise until a blue color just appears.

Ceric Ammonium Sulfate: Prepare a 1% (w/v) solution of cerium (IV) ammonium sulfate in 50% phosphoric acid.

Ceric Ammonium Molybdate: Dissolve 0.5 g of ceric ammonium sulfate ($\text{Ce}(\text{NH}_4)_4(\text{SO}_4)_4 \cdot 2\text{H}_2\text{O}$) and 12 g of ammonium molybdate ($(\text{NH}_4)_6\text{Mo}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}$) in 235 mL of water. Add 15 mL of conc. sulfuric acid.

Cerium Sulfate: Prepare a 10% (w/v) solution of cerium (IV) sulfate in 15% sulfuric acid.

Ferric Chloride: Prepare a 1% (w/v) solution of 1% ferric (III) chloride in 50% aqueous methanol.

Ehrlich's Reagent: Dissolve 1.0 g of *p*-dimethylaminobenzaldehyde in 75 mL of MeOH and add 50 mL of conc. HCl.

Dragendorff-Munier Stain: Dissolve 10 g of KI in 40 mL water. Add 1.5 g of $\text{Bi}(\text{NO}_3)_3$ and 20 g of tartaric acid in 80 mL of water. Stir for 15 minutes and then filter.