# *TLC Stains*

| **Stain** | **Uses** | **Recipe** |
|---|---|---|
| *p*-Anisaldehyde | General purpose stain, particularly good with groups with nucleophilic properties. | Add 15 ml of AcOH and 3.5 mL of *p*-Anisaldehyde to 350 mL ice cold EtOH. Cautiously add 50 mL concentrated $H_2SO_4$ dropwise over 60 minutes. Store unused portion at 0°C. |
| Ninhydrin | Particularly good for amino acids. | Dissolve 1.5 g ninhydrin in 100mL of *n*-butanol and add 3 mL AcOH. |
| $KMnO_4$ | Olefins and other readily oxidized groups. | Dissolve 1.5 g $KMnO_4$, 10 g $K_2CO_3$, and 1.25 mL 10% NaOH in 200 mL water. |
| Cerium Sulfate | General stain, particularly useful for alkaloids. | Make an aqueous solution of 10% Cerium (IV) sulfate and 15% $H_2SO_4$. |
| Morin Hydrate | General reagent. Fluorescently active. | Make up a 0.1 wt% solution in methanol. |
| Cerium Molybdate | General purpose stain. Requires heating to visualize. aka Hanessian's stain. | Dissolve 0.5g $Ce(NH_4)_2(NO_3)_6$ and 24.0 g of $(NH_4)_6Mo_7O_{24}{\cdot}4H_2O$. Carefully add 28 mL $H_2SO_4$, stir for 1 hour and filter if necessary. |
| 2,4-DNP | aldehydes and ketones | Dissolve 12 g of 2,4-dinitrophenylhydrazine, 60 mL of $H_2SO_4$, and 80 mL of $H_2O$ in 200 mL 95% EtOH. |
| Bromocresol Green | Acidic (pKA <5) groups | Add 0.04g bromocresol green to 100 mL absolute EtOH. Slowly drip in a 0.1M solution of NaOH until the solution just turns pale blue. |
| Phosphomolybdic Acid | General purpose | Dissolve 10 g PMA in 100 mL absolute ethanol |