



Recipes for TLC Stains



phosphomolybdic acid (PMA)

phosphomolybdic acid $12\text{MoO}_3 \cdot \text{H}_3\text{PO}_4$ (5 g)
EtOH (100 mL)

Dissolve phosphomolybdic acid in ethanol.

p-Anisaldehyde

p-anisaldehyde (13.0 mL)
glacial AcOH (5 mL)
conc. H_2SO_4 (18 mL)
EtOH (480 mL, 200 proof only)

Add AcOH and *p*-Anisaldehyde to **ice cold** EtOH.
Cautiously add conc. H_2SO_4 dropwise at **0°C**.

Basic KMnO_4

KMnO_4 (1.5 g)
 K_2CO_3 (10 g)
NaOH (0.125 g)
dist. H_2O (200 mL)

Add KMnO_4 and K_2CO_3 to water, then NaOH is added.

Cerium-ammonium-molybdate (CAM)

ammonium molybdate $(\text{NH}_4)_6\text{Mo}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}$ (25g)
Cerium(IV)sulfate $\text{Ce}(\text{SO}_4)_2$ (5g)
conc. H_2SO_4 (50 mL)
dist. H_2O (450 mL)

Add conc. H_2SO_4 to water, followed by ammonium molybdate and cerium(IV) sulfate.

Iodine

iodine (a few crystals)
silica gel (a few grams)

Disperse iodine crystals onto silica gel in a TLC chamber.

Dinitrophenylhydrazine (DNP) (Particularly good for aldehydes and ketones)

2,4-dinitrophenylhydrazine (12 g)
conc. H_2SO_4 (60 mL)
dist. H_2O (80 mL)
EtOH (200 mL)

Dissolve 2,4-dinitrophenylhydrazine, conc. H_2SO_4 , and H_2O in EtOH.

Ninhydrin (Particularly good for amino acids)

ninhydrin (1.5 g)
glacial acetic acid (3 mL)
n-butanol (100 mL)

Dissolve ninhydrin in *n*-butanol and add AcOH.