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## Indicators and Indicator Test Papers

### INDICATORS

#### 1. SCOPE

Indicators are required in Pharmacopeial tests and assays either to indicate the completion of a chemical reaction in volumetric analysis or to indicate the hydrogen-ion concentration (pH) of solutions. The necessary solutions of indicators are listed among the *Test Solutions*, abbreviated TS.

#### 2. PREPARATION OF SOME INDICATORS

Solution of indicators of the basic type and of the phthaleins are prepared by dissolving in alcohol.

With indicators containing an acidic group, the acid must first be neutralized with sodium hydroxide (NaOH) as follows. Triturate 100 mg of the indicator in a smooth-surfaced mortar with the volume of 0.05 N sodium hydroxide specified in the directions for preparing its test solution, or with the equivalent of 0.02 N sodium hydroxide. After solubilization of the indicator, dilute the solution with carbon dioxide-free water to 200 mL (final concentration 0.05%). Store the solution in suitably resistant containers, protected from light.

#### 3. pH RANGE AND COLOR CHANGE FOR SOME USEFUL INDICATORS

Indicator	pH Range	Color Change
Malachite green oxalate	0.0–2.0	yellow–green
Thymol blue	1.2–2.8	red–yellow
Quinaldine red	1.4–3.2	colorless–red
Methyl yellow	2.9–4.0	red–yellow
Bromophenol blue	3.0–4.6	yellow–blue
Methyl orange	3.2–4.4	pink–yellow
Bromocresol green	4.0–5.4	yellow–blue
Methyl red	4.2–6.2	red–yellow
Bromocresol purple sodium salt	5.0–6.8	greenish yellow–purple-violet
Bromocresol purple	5.2–6.8	yellow–purple
Bromothymol blue	6.0–7.6	yellow–blue
Phenol red	6.8–8.2	yellow–red
Neutral red	6.8–8.0	red–orange
Cresol red	7.2–8.8	yellow–red
Thymol blue	8.0–9.2	yellow–blue
Thymolphthalein	8.6–10.0	colorless–blue
Phenolphthalein	8.0–10.0	colorless–red

Indicator	pH Range	Color Change
p-Naphtholbenzein	8.8–10.0	orange–green
Nile blue hydrochloride	9.0–13.0	blue–pink

**Auxiliary Information** - Please [check for your question in the FAQs](#) before contacting USP.

Topic/Question	Contact	Expert Committee
INDICATORS INTRODUCTION	<a href="#">Margareth R.C. Marques</a> Principal Scientific Liaison	HDQ Headquarters

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