

INVESTIGATION 2-G

GUIDED INQUIRY

Skills and Strategies

- Planning and Conducting
- Processing and Analyzing
- Evaluating

Safety



- Wear safety goggles and gloves.
- The materials can become quite hot. Avoid touching the hot liquid or glass. Use a thermal glove or tongs.

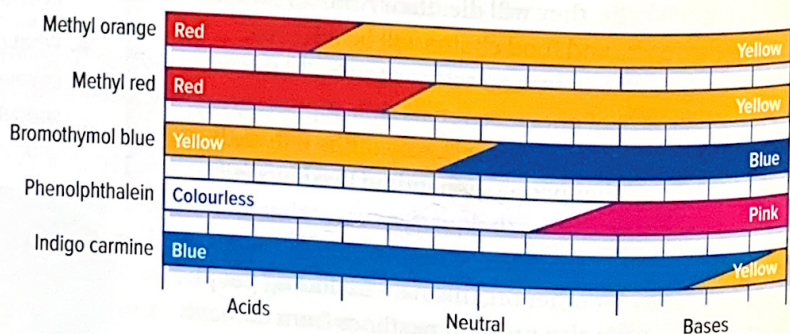
What You Need

- spot plates
- small test tubes
- masking tape
- unknowns 1, 2, 3, and 4
- Mg ribbon
- red and blue litmus paper
- bromothymol blue indicator
- methyl red indicator
- methyl orange indicator
- phenolphthalein indicator
- distilled water

Using Acid and Base Properties to Identify Four Unknowns

The following chart indicates the colour changes of some common acid-base indicators. The table below summarizes additional properties of acids and bases.

Indicator	pH Range in Which Colour Change Occurs	Colour Change as pH Increases
Methyl orange	3.2–4.4	red to yellow
Methyl red	4.8–6.0	red to yellow
Bromothymol blue	6.0–7.6	yellow to blue
Phenolphthalein	8.2–10.0	colourless to pink
Indigo carmine	11.2–13.0	blue to yellow



Property	Acid	Bases
Litmus test	turns blue litmus red	turns red litmus blue
Reaction with metal	yes (most)	no (most)
pH	less than 7	greater than 7