

University of Utah Chemistry Demonstration:

Blue Bottle Experiments (with varying indicators)

Blue Bottle -

Reagents:

- 1 L distilled H₂O
- 30 g glucose (C₆H₁₂O₆)
- 85 mL 6 M NaOH
(to prepare: add 239.83 g NaOH to 1 L H₂O - note: this rxn is exothermic)
- 6-8 drops methylene blue indicator
(to prepare: add 0.2 g blue methylene in 100 mL H₂O)

Preparation:

The following can be done ahead of time:

- Dissolve 30 g glucose in 1L H₂O in 2 L Erlenmeyer flask

Add following the materials to the flask within 15 minutes of demonstration:

- Add 6-8 drops of methylene blue
- Add 85 mL 6 M NaOH

Instructions:

- Allow flask to rest until solution is colorless.
- With a rubber stopper shake the flask until a blue color appears. Repeat.

Disposal: Can be poured down the drain

Why did the solution change color when it was shaken? Because it reacts with the air. The indicators are redox indicators, and produce color when oxidized (interact with air), and are colorless in reduced states.

(see back side for more bottle experiments)



SAFETY

NaOH.....corrosive

Yellow-Red-Green Bottle -

Reagents:

- 1 L distilled H₂O
- 30 g glucose (C₆H₁₂O₆)
- 100 mL 6 M NaOH
(to prepare: add 239.83 g NaOH to 1 L H₂O - note: this rxn is exothermic)
- 60 drops indigo carmine indicator
(to prepare: add 0.25 g indigo carmine in 25 mL H₂O)

Preparation:

The following can be done ahead of time:

- Dissolve 30 g glucose in 1L H₂O in 2 L Erlenmeyer flask

Add following the materials to the flask within 15 minutes of demonstration:

- Add 60 drops of indigo carmine
- Add 100 mL 6 M NaOH

Instructions:

- Allow flask to rest until solution is yellow.
- With a rubber stopper shake the flask until red. Shake again until green. Repeat.

Disposal: Can be poured down the drain



Pink Bottle -

Reagents:

1 L distilled H₂O

30 g glucose (C₆H₁₂O₆)

85 mL 6 M NaOH

(to prepare: add 239.83 g NaOH
to 1 L H₂O - note: this rxn is
exothermic)

6-8 drops resazurin indicator

(to prepare: add 0.1 g blue
resazurin in 100 mL H₂O)

Preparation:

The following can be done ahead of
time:

- Dissolve 30 g glucose in 1L H₂O
in 2 L Erlenmeyer flask

Add the following materials to the flask
within 15 minutes of demonstration:

- Add 6-8 drops of resazurin
- Add 85 mL 6 M NaOH

Instructions:

- Allow flask to rest until solution is
colorless. This might take longer
than the other bottles
- With a rubber stopper shake the
flask until a pink appears.
Repeat.

Disposal: Can be poured down
the drain

Pink-Purple-Blue Bottle -

Reagents:

1 L distilled H₂O

30 g glucose (C₆H₁₂O₆)

85 mL 6 M NaOH

(to prepare: add 239.83 g NaOH
to 1 L H₂O - note: this rxn is
exothermic)

6-8 drops methylene blue indicator

(to prepare: add 0.2 g blue
methylene in 100 mL H₂O)

6-8 drops resazurin indicator

(to prepare: add 0.1 g blue
resazurin in 100 mL H₂O)

Preparation:

The following can be done ahead of
time:

- Dissolve 30 g glucose in 1L H₂O
in 2 L Erlenmeyer flask

Add the following materials to the flask
within 15 minutes of demonstration:

- Add 6-8 drops of methylene blue
- Add 6-8 drops of resazurin
- Add 85 mL 6 M NaOH

Instructions:

- Allow flask to rest until solution is
colorless.
- With a rubber stopper shake the
flask until a pink color appears.
Shake again for purple. Then
finally shake for blue. Repeat.

Disposal: Can be poured down the
drain