

Chemical chameleon

Material:

- Potassium permanganate, KMnO_4
- Sodium hydroxide, NaOH - Caustic soda
- Sugar
- Tall beaker
- Erlenmeyer flask
- Spatula
- Stirring rod
- Gloves and safety goggles

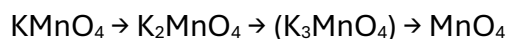
Procedure:

1. Prepare a 10g sodium hydroxide and 6g sugar solution in 750ml water
2. Prepare a 2mg potassium permanganate solution in 500ml water
3. Mix both solutions together
4. Observe the color changes over time

Explanation:

The oxidation state of an atom is a quantity that describes the hypothetical electrical charge of an atom if every bond to other atoms were fully ionic. It is expressed by an integer. It is useful in predicting the real charge of an atom in a chemical compound, in writing chemical equations, etc.

Every element has several possible oxidation states. In this experiment there is a chain of chemical reactions in which the manganese atoms change their oxidation state:



The bonds that the manganese atoms make in the compounds they belong to vary along this reaction chain, causing a variation in the oxidation state over time (+7 → +6 → (+5) → +4). Since the oxidation states of manganese have very distinct colors, there are observable changes in the color of the solution as the compounds that contain manganese react!