

CANADIAN CHEMISTRY CONTEST

CHEMISTRY

TOPIC QUESTIONS

King

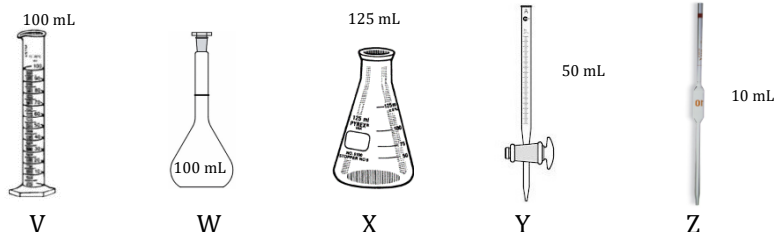


0. Safety



KingCh

- 1) Sodium hydroxide (NaOH) is commonly used in high school labs. NaOH is a WHMIS category 1 health hazard causing severe eye, skin and respiratory tract effects. NaOH is hygroscopic and readily absorbs moisture from the air. Any prepared solution of NaOH should be standardized to determine its precise concentration. You have the glassware V, W, X, Y, Z below and solid pellets of NaOH.



Which of the choices provides the safest, most efficient method of preparing exactly 100.0 mL NaOH of approximately 1M before standardizing the solution with 0.500 M oxalic acid ($C_2O_4H_2$)? Assume the NaOH solution is mixed thoroughly once prepared.

- A) Filling V with approximately 50 mL water, adding 4.0 g NaOH, diluting to precisely 100 mL in V.
 B) Filling W with approximately 50 mL water, adding 4.0 g NaOH and diluting to 100 mL in W.
 C) Placing 4.0 g NaOH in X then adding 100 mL of water to X using Y.
 D) Placing 4.0 g NaOH in W then adding 100 mL of water to W using Z.
 E) Filling X with precisely 50 mL of water using Z, adding 4.0 g of NaOH and adding an additional 50 mL of water using Z.

CCC 2018

- 1) Which of the following metals should be labelled with the WHMIS symbol for flammable substances ?

- A) Al B) Ni C) Mg D) Pb E) Hg

CCC 2017

- 1) WHMIS 2015 is the updated labelling system which conforms to the new international standard of classifying hazardous materials. Although all of the compounds below would require some labelling for other characteristics, which compound would **NOT** require the oxidizer label shown to the right?

- A) potassium permanganate B) sodium chlorate
 C) ethanol D) nitric acid
 E) hydrogen peroxide



CCC 2016

1. Through the Workplace Hazardous Materials Information System (WHMIS), labs use eight labels to identify the dangers chemists encounter from the six classes of hazardous materials. Using your knowledge of the properties of chemical substances, identify the list below which contains three chemicals that should ALL be identified with the flammable materials label?

- A) Copper wire, sodium chloride and helium
 B) Hydrogen, magnesium wire, ethanol
 C) Platinum wire, iron (III) oxide, carbon dioxide
 D) Neon, potassium iodide, silver wire
 E) Liquid mercury, calcium bromide, nitrogen



CCC 2015

1. Bearing in mind the WHMIS symbols associated with each substance, which of the following is/are safe to store next to copper metal?

I) 10.0 mol L⁻¹ nitric acid



II) 12.0 mol L⁻¹ hydrochloric acid



III) 100% Methanol



- A) I only B) II only C) III only D) I and III E) II and III

CCC 2013

1. Each of the following acids might be found in a typical high school laboratory acid storage cupboard. Which of them should be stored in a separate compartment within the acid storage cupboard? The WHMIS symbols for each acid are indicated.

I. 10 mol L⁻¹ HNO₃



II. 12 mol L⁻¹ HCl



III. 18 mol L⁻¹ H₂SO₄



- A. I only B. II only C. III only
 D. II and III E. All of them should be stored separately

CCC 2012

1. Copper (II) sulfate pentahydrate is a compound commonly used in high school laboratories. The MSDS label classifies this compound as a moderate health hazard (Level 2). Which of the following symbol(s) should appear on a WHMIS label of solid copper(II) sulfate pentahydrate?



- A. I only B. II only C. III only
 D. II and III only E. I, II and III

CCC 2011

1. What WHMIS symbol(s) would be found on a bottle of methanol?



- A. I only B. II only C. III only
 D. II and III only E. I, II and III

CCC 2010

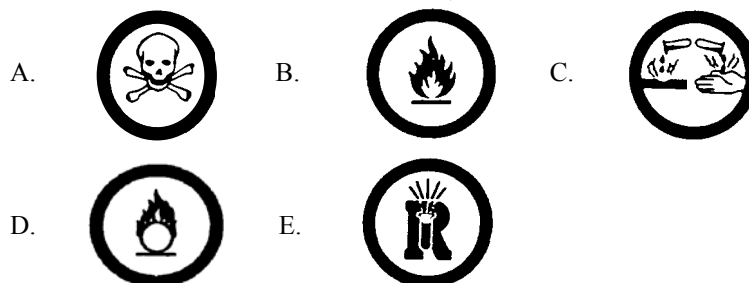
1. You have been asked to insert a thermometer through a rubber stopper. There is resistance upon your first try. Which of the following actions should you take (in the correct order)?

- (i) Try to put the thermometer through again
 (ii) Wrap the thermometer with rubber tubing or paper towel
 (iii) Lubricate the bulb of the thermometer with water or glycerin
 (iv) Get a friend to hold the stopper while you push in the thermometer

- A. i B. ii, i C. iii, i D. iii, iv E. iii, ii, i

CCC 2009

1. Sodium metal is kept under oil because it reacts violently with water, and more slowly with air. Which one of the following WHMIS symbols best informs you that a substance might react violently with air and/or water?



CCC 2008