# Table E Selected Polyatomic Ions

1 What is the chemical formula for zinc carbonate?

(1) $ZnCO_3$ (3) $Zn_2CO_3$

(2) $Zn(CO_3)_2$ (4) $Zn_3CO_2$

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2 Given the incomplete equation representing a reaction:

$$2Na(s) + 2H_2O(\ell) \rightarrow 2Na^+(aq) + 2\ \_\_\_\_\_(aq) + H_2(g)$$

What is the formula of the missing product?

(1) $O^{2-}$ (3) $OH^-$

(2) $O_2$ (4) OH

3 Which formula represents ammonium nitrate?

(1) $NH_4NO_3$ (3) $NH_4(NO_3)_2$

(2) $NH_4NO_2$ (4) $NH_4(NO_2)_2$

4 What is the chemical name of the compound $NH_4SCN$?

(1) ammonium thiocyanate (3) nitrogen hydrogen cyanide

(2) ammonium cyanide (4) nitrogen hydrogen sulfate

5 Which polyatomic ion is found in the compound represented by the formula $NaHCO_3$?

(1) acetate (3) hydrogen sulfate

(2) hydrogen carbonate (4) oxalate

6 Which positive ion must be present in an aqueous solution of an Arrhenius acid?

(1) $H_3O^+$ (3) $NH_4^+$

(2) $Na^+$ (4) $Rb^+$

Base your answers to questions 7 on the information below.

A total of 1.4 moles of sodium nitrate is dissolved in enough water to make 2.0 liters of an aqueous solution. The gram-formula mass of sodium nitrate is 85 grams per mole.

7 Write the chemical formula for the solute in the solution.

Base your answers to questions 8 on the information below and on your knowledge of chemistry.

A company produces a colorless vinegar that is 5.0% $HC_2H_3O_2$ in water. Using thymol blue as an indicator, a student titrates a 15.0-milliliter sample of the vinegar with 43.1 milliliters of a 0.30 M NaOH(aq) solution until the acid is neutralized.

8 Identify the negative ion in the NaOH(aq) used in this titration.

Base your answers to questions 9 on the information below and on your knowledge of chemistry.

In a titration using a pH meter, 16.0 milliliters of 0.18 M NaOH(aq) exactly neutralizes a 24.0-milliliter sample of HCl(aq) in a flask. During this laboratory activity, appropriate safety equipment was used and safety procedures were followed.

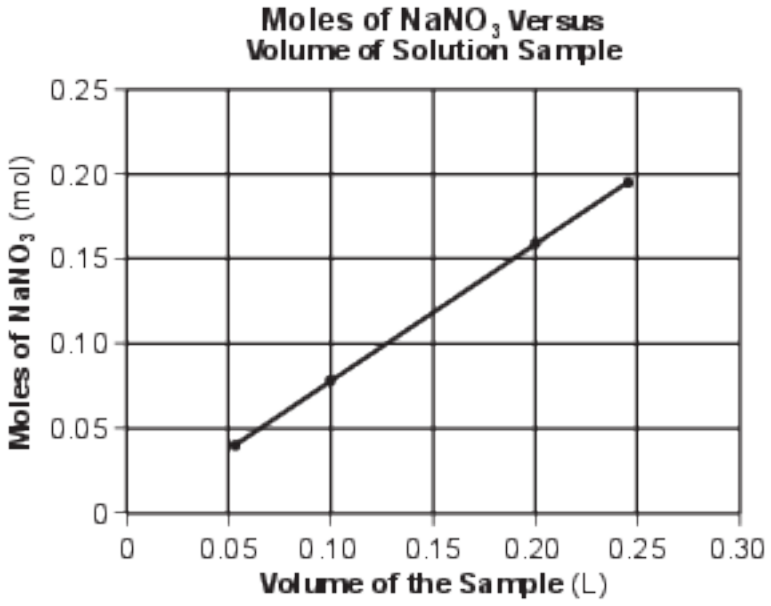
9 Identify the negative ion in the NaOH(aq) used in the titration. [1]

Base your answers to questions 10 on the information below and on your knowledge of chemistry.

Four different samples of $NaNO_3(aq)$ are each evaporated to dryness. The solution volume and mass of the dry $NaNO_3(s)$ of each sample are recorded in the table below.

| Sample | Volume of $NaNO_3(aq)$ (L) | Mass of dry $NaNO_3(s)$ (g) |
|---|---|---|
| 1 | 0.0524 | 3.56 |
| 2 | 0.0988 | 6.72 |
| 3 | 0.2017 | 13.71 |
| 4 | 0.2431 | 16.53 |

The number of moles of $NaNO_3(s)$ of each sample was then calculated and used to produce the graph below.




10 Write a chemical name for $NaNO_3$. [1]

**Answer Keys**

1 1

2 3

3 1

4 1

5 2

6 1

7 Allow 1 credit for $NaNO_3$.

8 Allow 1 credit for $OH^-$ or hydroxide.

9 Allow 1 credit for $OH^-$ or hydroxide or hydroxide ion.
- Note: Do not allow credit for OH or hydroxyl or hydroxyl ion.

10 Allow 1 credit for sodium nitrate.