

Polyatomic Compounds Quiz Answer Key PDF

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What is the charge on a sulfate ion (SO_4)?

- A. 1-
- B. 2- ✓**
- C. 3-
- D. 4-

Which of the following are examples of polyatomic ions?

- A. NO_3^- ✓**
- B. Cl^-
- C. SO_4^{2-} ✓**
- D. PO_4^{3-} ✓**

Explain the significance of polyatomic ions in the formation of ionic compounds. How do they differ from monatomic ions in terms of structure and bonding?

Polyatomic ions are charged species composed of multiple atoms covalently bonded, which can participate in ionic bonding to form compounds. Unlike monatomic ions, which consist of a single atom, polyatomic ions have a complex structure that allows them to form more diverse compounds.

Which prefix indicates the presence of more oxygen atoms in a polyatomic ion?

- A. hypo-
- B. per- ✓**
- C. mono-
- D. di-

Which of the following compounds contain polyatomic ions?

- A. NaCl
- B. CaSO₄ ✓**
- C. NH₄Cl ✓**
- D. H₂O

Describe the process of naming a compound that contains a polyatomic ion. Include an example in your explanation.

Naming a compound with a polyatomic ion involves naming the cation first, followed by the anionic part. For example, in sodium nitrate (NaNO₃), "sodium" is the cation and "nitrate" is the polyatomic anionic part.

What is the name of the polyatomic ion NH₄⁺?

- A. Ammonium ✓**
- B. Nitrate
- C. Nitrite
- D. Hydroxide

Which of the following are correct chemical formulas for compounds containing polyatomic ions?

- A. NaNO₃ ✓**
- B. CaCO₃ ✓**
- C. KClO₄ ✓**
- D. MgSO₃

Discuss the role of polyatomic compounds in agriculture. Provide examples of specific compounds and their uses.

Polyatomic compounds like ammonium nitrate and potassium phosphate are used as fertilizers to provide essential nutrients to plants, enhancing growth and crop yield.

What is the correct formula for calcium phosphate?

- A. Ca₃(PO₄)₂ ✓**
- B. CaPO₄
- C. Ca₂PO₄



Which of the following naming conventions are correct for polyatomic ions?

- A. Sulfate ends in "-ate" ✓
- B. Nitrate ends in "-ite"
- C. Phosphate ends in "-ate" ✓
- D. Hypochlorite ends in "-ite" ✓

Analyze the impact of polyatomic compounds in the medical field. How do they contribute to healthcare and medicine?

Polyatomic compounds like bicarbonates are used in antacids to neutralize stomach acid, and phosphates are used in laxatives and enemas to treat constipation.

Which of the following is a common use of ammonium nitrate?

- A. Fertilizer ✓
- B. Plastic production
- C. Antacid
- D. Food preservative

Which of the following polyatomic ions contain oxygen?

- A. NH_4^+
- B. CO_3^{2-} ✓
- C. NO_2^- ✓
- D. ClO_3^- ✓

Evaluate the environmental implications of using polyatomic compounds in industry. What are the potential benefits and drawbacks?

Benefits include improved agricultural productivity and industrial efficiency. Drawbacks include potential pollution and eutrophication from runoff, leading to environmental harm.

What is the charge on a phosphate ion (PO_4)?

- A. 1-
- B. 2-
- C. 3- ✓**
- D. 4-

Which of the following are correct names for the given polyatomic ions?

- A. NO_3^- is nitrate ✓**
- B. SO_3^{2-} is sulfite ✓**
- C. ClO_4^- is perchlorate ✓**
- D. PO_4^{3-} is phosphite

Create a balanced chemical equation for the reaction between sodium hydroxide and sulfuric acid. Explain the role of polyatomic ions in this reaction.

The balanced equation is $2 \text{NaOH} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + 2 \text{H}_2\text{O}$. The sulfate ion (SO_4^{2-}) acts as a polyatomic ion that combines with sodium ions to form sodium sulfate.

Which of the following compounds is used in the production of glass?

- A. Sodium carbonate ✓**
- B. Calcium sulfate
- C. Ammonium chloride
- D. Potassium nitrate

Which of the following compounds are typically used in household cleaning products?

- A. Sodium bicarbonate ✓**
- B. Calcium carbonate
- C. Ammonium hydroxide ✓**
- D. Magnesium sulfate

Discuss how the structure of polyatomic ions affects their chemical reactivity and stability. Provide examples to support your explanation.

The covalent bonds within polyatomic ions provide stability, but the overall charge allows them to react with other ions. For example, the nitrate ion (NO_3^-) is stable but reactive in forming compounds like ammonium nitrate.

What is the name of the polyatomic ion ClO_3^- ?

- A. Chlorate ✓**
- B. Chlorite
- C. Hypochlorite
- D. Perchlorate