

Full Name:

February 22,
2023

0.1 Name or formulate the following acids or bases: (a) Sulfuric Acid (b) H_2CO_3 (c) Lithium hydroxide

0.2 Name or formulate the following acids or bases: (a) HCl (b) Hydrofluoric Acid (c) $\text{Mg}(\text{OH})_2$

0.3 From the following chemicals identify acids and bases: (a) H_2SO_3 (b) NH_3 (c) $\text{Ca}(\text{OH})_2$

0.4 From the following chemicals identify acids and bases: (a) KOH (b) LiOH (c) CH_3OH

0.5 From the following chemicals identify hydric acids and oxoacids: (a) H_3BO_3 (b) HCl (c) HI

0.6 From the following chemicals identify hydric acids and oxoacids: (a) HF (b) H_2SO_3 (c) H_2S

0.7 Working in pairs, memorize the following oxoacids: (a) HNO_3 Nitric acid

(b) H_3PO_4 Carbonic acid

(c) $\text{H}_2\text{Cr}_2\text{O}_7$ Dichromic acid

0.8 Working in pairs, memorize the following oxoacids: (a) H_2SO_4 Sulfuric acid

(b) H_2CO_3 Carbonic acid

(c) HMnO_4 Permanganic acid

0.9 Identify the redox number of the central atom of the following oxoacids: (a) H_2MnO_4 (b) HReO_3 (c) H_2SiO_3

0.10 Identify the redox number of the central atom of the following oxoacids: (a) H_2CrO_4 (b) $\text{H}_2\text{Cr}_2\text{O}_7$ (c) HMnO_4

0.14 Identify the most oxidant acid:

(a) H_2CrO_4 or $\text{H}_2\text{Cr}_2\text{O}_7$ | (b) HNO_3 or HNO_4

0.11 Identify the most reduced acid:

(a) H_2RuO_4 or HRuO_4 | (b) HTcO_4 or H_2TcO_4

0.15 Name or formulate the following covalent compounds: (a) Chlorine Monofluoride (b) N_2O (c) Nitrogen trifluoride

0.12 Identify the most oxidated acid:

(a) H_3AsO_4 or H_3AsO_3 | (b) H_2XeO_4 or H_4XeO_6

0.16 Name or formulate the following covalent compounds: (a) NO (b) Dichlorine monofluoride (c) NO_2

0.13 Identify the most oxidant acid:

(a) $\text{H}_2\text{S}_2\text{O}_6$ or H_2SO_4 | (b) H_2SeO_4 or H_2SeO_3

0.17 Name or formulate the following covalent compounds: (a) P_4S_3 (b) Sulfur Tetrafluoride (c) As_2O_5 (d) Sulfur trioxide

0.18 Name or formulate the following covalent compounds: (a) SO_3 (b) Disulfur dichloride (c) SO_2 (d) Disulfur tetrachloride

0.19 Combine the following ions:

- | | |
|------------------------------------|--------------------------------------|
| (a) $\text{Na}^+ + \text{Cl}^-$ | (d) $\text{Mg}^{2+} + \text{Cl}^-$ |
| (b) $\text{Na}^+ + \text{Se}^{2-}$ | (e) $\text{Mg}^{2+} + \text{O}^{2-}$ |
| (c) $\text{Na}^+ + \text{P}^{3-}$ | (f) $\text{Mg}^{2+} + \text{N}^{3-}$ |

0.20 Classify the following chemicals in two groups, justifying your classification: (a) NaCl (b) CO_2 (c) FeCl_3 (d) N_2O_3 (e) SO_3 (f) Ca_3N_2

0.21 Name or formulate the following ionic (Type I) compounds: (a) Magnesium fluoride (b) CaS (c) Barium phosphide (d) Mg_3N_2

0.22 Name or formulate the following ionic (Type I) compounds: (a) Magnesium iodide (b) Ca_3P_2 (c) Lithium nitride (d) MgF

0.23 Combine the following ions:

- | | |
|--------------------------------------|--------------------------------------|
| (a) $\text{Cs}^+ + \text{F}^-$ | (c) $\text{Be}^{2+} + \text{C}^{4-}$ |
| (b) $\text{Sr}^{2+} + \text{O}^{2-}$ | (d) $\text{Li}^+ + \text{I}^-$ |

0.24 Name the following compounds:

- | | |
|-----------------------------|-------------------|
| (a) NaCl | (d) SrS |
| (b) Ca_3N_2 | (e) RbCl |
| (c) MgI_2 | (f) KF |

0.25 Formulate the following compounds:

- | | |
|------------------------|-------------------------|
| (a) Copper(I) oxide | (c) Nickel(III) oxide |
| (b) Copper(II) nitride | (d) Manganese(IV) oxide |

- | | |
|----------------------|-----------------------|
| (a) FeO | (e) MnF ₃ |
| (b) CrN | (f) Cu ₂ C |
| (c) ZnI ₂ | (g) Ag ₂ O |
| (d) CoS | |

0.26 Classify the following chemicals in two groups. Justify your classification.

- | | | |
|----------------------|-----------------------|-----------------------|
| (a) NaCl | (c) FeCl ₃ | (e) Li ₃ N |
| (b) MnO ₂ | (d) SrO | (f) NiO |

0.30 Name the following compounds:

- | | |
|------------------------------------|-------------------------------------|
| (a) Ni ₂ O ₃ | (d) Ni ₃ P ₂ |
| (b) Fe ₃ N ₂ | |
| (c) Cr ₂ O ₃ | (e) Ru ₂ Se ₃ |

0.27 Formulate the following compounds:

- (a) Iron(II) nitride
- (b) Copper(I) sulfide
- (c) Chromium(III) iodide
- (d) Palladium(IV) phosphide
- (e) Manganese(VI) oxide

0.28 Name the following compounds:

- | | |
|------------------------------------|----------------------|
| (a) NiO | (c) VO |
| (b) Cr ₂ O ₃ | (d) MnO ₄ |

0.29 Name the following compounds:

0.31 Name or formulate the following ionic (Type II) compounds:

- (a) Fe₂S₃ (b) Gold(III) chloride (c) FeO (d) Vanadium(V) nitride

0.32 Name or formulate the following ionic (Type II) compounds:

- (a) Fe₃P₂ (b) Copper(II) iodide (c) Fe₃N₂ (d) Iron(II) sulfide

0.33 Name or formulate the following ionic (Type II) compounds:

- (a) Manganese(IV) oxide (b) FeCl₂ (c) Copper(I) oxide

0.34 Name or formulate the following ionic (Type II) compounds:
(a) FeI_2 (b) Lead(IV) sulfide (c) FeBr_2

0.35 Indicate if the following chemical species represent an atom, and anion or a cation: (a) Cs (b) Cs^+ (c) N^{-3}

0.36 Indicate if the following chemical species represent an atom, and anion or a cation: (a) Fe^{2+} (b) Cl^- (c) Ag

0.37 Identify the ionic state of the following elements. If needed, indicate the existence of multiple ionic states: (a) Li (b) V (c) Cl (d) S (e) Cr (f) Sr (g) Ni

0.38 Identify the ionic state of the following elements. If needed, indicate the existence of multiple ionic states: (a) H (b) O (c) N (d) F (e) Mn

0.39 Name or formulate the following (Type I) oxosalts: (a) $\text{Mg}(\text{NO}_3)_2$ (b) Sodium permanganate (c) KMnO_4 (d) Calcium carbonate (e) Li_3PO_4

0.40 Name or formulate the following oxoanions: (a) ClO_4^- (b) PO_4^{3-} (c) SO_4^{2-} (d) CO_3^{2-} (e) NO_3^- (f) CrO_4^{2-} (g) BO_3^{3-}

0.41 Name or formulate the following compounds: (a) Na_2SO_4 (b) KNO_3 (c) CaCO_3 (d) $\text{Ca}(\text{NO}_2)_2$ (e) SrSO_3

0.42 Name or formulate the following (Type I) oxosalts: (a) Lithium sulfate (b) Na_2CrO_4 (c) Lithium sulfite (d) $\text{Cs}_2\text{Cr}_2\text{O}_7$ (e) Calcium sulfate

0.43 Combine the following polyatomic ions:

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|--------------------------------------|---|
| (a) $\text{Na}^+ + \text{NO}_3^-$ | (d) $\text{Ca}^{2+} + \text{CO}_3^{2-}$ |
| (b) $\text{Na}^+ + \text{CO}_3^{2-}$ | |
| (c) $\text{Na}^+ + \text{PO}_4^{3-}$ | (e) $\text{Ca}^{2+} + \text{PO}_4^{3-}$ |

0.44 Combine the following ions:

- | | |
|--------------------------------------|--|
| (a) $\text{Na}^+ + \text{PO}_4^{3-}$ | (d) $\text{Ca}^{2+} + \text{CO}_3^{2-}$ |
| (b) $\text{Li}^+ + \text{MnO}_4^-$ | (e) $\text{Cs}^+ + \text{Cr}_2\text{O}_7^{2-}$ |
| (c) $\text{Mg}^{2+} + \text{NO}_3^-$ | (f) $\text{K}^+ + \text{BO}_3^{3-}$ |

0.45 Name or formulate the following (Type II) oxosalts: (a) cobalt(III) carbonate (b) $\text{Fe}(\text{ClO}_4)_3$ (c) zinc(II) carbonate

0.46 Name or formulate the following (Type II) oxosalts: (a) $\text{Cr}_2(\text{SO}_4)_3$ (b) zinc(II) carbonate (c) $\text{Fe}(\text{MnO}_4)_3$

0.47 Name or formulate the following hydrosalts: (a) Sodium dihydrogenphosphate (b) LiH_2PO_4 (c) Silver monohydrogenphosphate

0.48 Name or formulate the following hydrosalts: (a) NaHCO_3 (b) Calcium Hydrogencarbonate (c) $\text{Al}(\text{HSO}_4)_3$

0.49 Name or formulate the following hydrates: (a) $\text{KMnO}_4 \cdot 4 \text{H}_2\text{O}$ (b) Lithium sulfate tetrahydrate

0.50 Name or formulate the following hydrates: (a) $\text{Al}_2(\text{SO}_4)_3 \cdot 3 \text{H}_2\text{O}$ (b) Silver phosphate dihydrate

0.54 Name or formulate the following compounds: (a) MnSO_4 (b) CuNO_3 (c) $\text{Cr}_2(\text{CO}_3)_3$ (d) $\text{V}(\text{NO}_2)_2$ (e) FeSO_3

0.51 Name or formulate the following compounds: (a) $\text{Ca}(\text{NO}_3)_2$ (b) $\text{Ca}(\text{HCO}_3)_2$ (c) Nickel(II) sulfate (d) Nickel(II) sulfate tetrahydrate (e) NaH_2PO_4

0.52 Name or formulate the following compounds: (a) MgSO_4 (b) $\text{Ni}(\text{SO}_4)_3$ (c) Cobalt(II) nitrate (d) Cobalt(II) sulfate dihydrate (e) KHCO_3

0.53 Name or formulate the following pairs or ions: (a) carbonate and monohydrogencarbonate (b) sulfate and monohydrogensulfate (c) chromate and monohydrogenchromate (d) phosphate and dihydrogenphosphate (e) phosphate and monohydrogenphosphate (f) borate and dihydrogenphosphate

