

CHEMISTRY 12 – OXIDATION #S AND REDOX REACTIONS WORKSHEET #2

1) Electrons are lost by the (1 mark)

reducing agent as it undergoes oxidation

reducing agent as it undergoes reduction

oxidizing agent as it undergoes oxidation

oxidizing agent as it undergoes reduction

2) An oxidizing agent is (1 mark)

reduced as it loses electrons

reduced as it gains electrons

oxidized as it loses electrons

oxidized as it gains electrons

3) Chlorine gas is a stronger oxidizing agent than silver sulphide. What is meant by the term *stronger oxidizing agent*? (1 mark)

A stronger oxidizing agent has a higher affinity for electrons, and is therefore more readily reduced than the other chemical species.

4) Al_(s) is a stronger reducing agent than Cr_(s). What is meant by the term *stronger reducing agent*? (1 mark)

A stronger reducing agent has a higher ability to lose electrons, and is therefore more readily oxidized than the other chemical species.

5) Which of the following is the strongest reducing agent? (1 mark)

Cu⁺

Pb

Ca

F₂

6) Which of the following is the strongest oxidizing agent? (1 mark)

Br₂

H₂Se

Ag⁺

SO₄²⁻

7) The acidified substances H₂O₂, H₃PO₄ and H₂SO₃ in order of increasing strengths as oxidizing agents are: (1 mark)

H₂O₂, H₃PO₄, H₂SO₃

H₂SO₃, H₃PO₄, H₂O₂

H₃PO₄, H₂SO₃, H₂O₂

H₂O₂, H₂SO₃, H₃PO₄

8) Which of the following is the weakest oxidizing agent? (1 mark)

Cu²⁺

Pb²⁺

Ni²⁺

Sn²⁺

9) Which of the following is the strongest reducing agent? (1 mark)

H₂S

H₂O

H₂Se

H₂Te

10) List the ions Co²⁺, Cu²⁺ and Zn²⁺ in order from strongest to weakest oxidizing agents. (1 mark)

Zn²⁺ > Co²⁺ > Cu²⁺

Co²⁺ > Cu²⁺ > Zn²⁺

Cu²⁺ > Zn²⁺ > Co²⁺

Cu²⁺ > Co²⁺ > Zn²⁺

11) Which of the following is the weakest reducing agent? (1 mark)

Co

Cu

Ca

Cr

12) Which of the following is the strongest oxidizing agent? (1 mark)

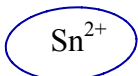
BrO₃⁻

ClO₄⁻

S₂O₈²⁻

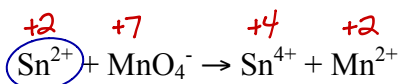
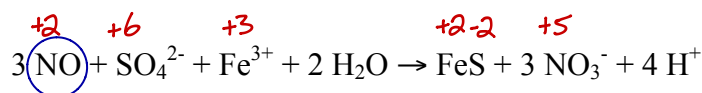
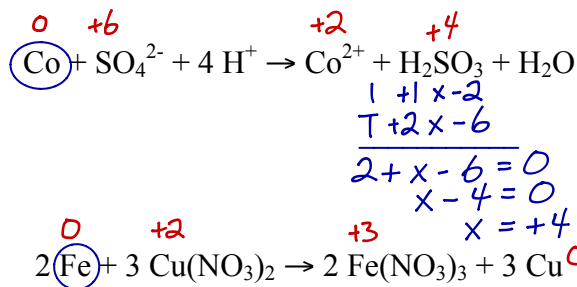
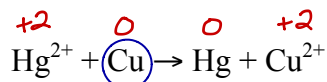
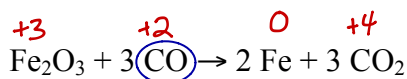
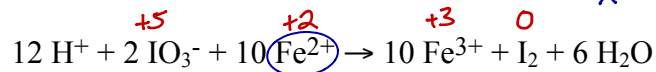
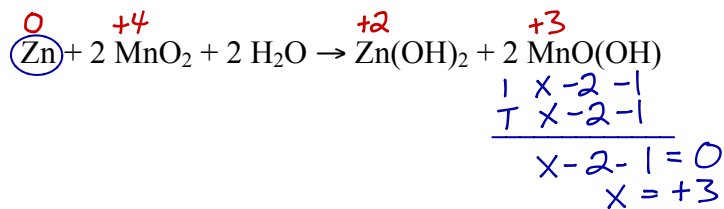
Cr₂O₇²⁻

13) Which of the following is the strongest reducing agent? (1 mark)



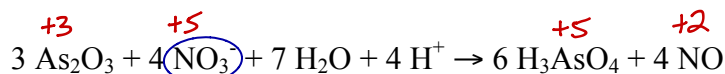
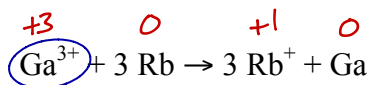
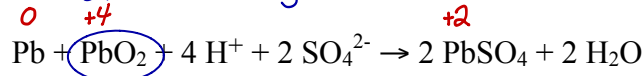
14) Identify the reducing agent in the following reactions: (8 marks)

Undergoes oxidation \therefore loses electrons & oxidation # \uparrow

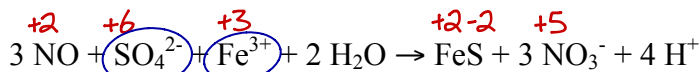
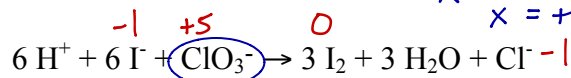


15) Identify the oxidizing agent in the following reactions: (8 marks)

Undergoes reduction \therefore gains electrons & oxidation # \downarrow

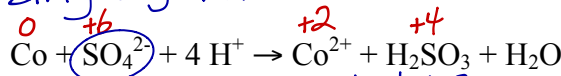


$$\begin{array}{r} 1 \times +1 \times -2 \\ 7 \times +3 \times -8 \\ \hline 3 + x - 8 = 0 \\ x - 5 = 0 \\ x = +5 \end{array}$$



OR

this is an example of a reaction where 2 chemicals work together to act as an oxidizing agent



$$\begin{array}{r} 1 \times +1 \times -2 \\ 7 \times +3 \times -8 \\ \hline 2 + x - 6 = 0 \\ x - 4 = 0 \\ x = +4 \end{array}$$

