Reactions: Unit 7

Practice Free Response 2

Directions: The suggested time is about 15 minutes for answering the constructed response section of the chemistry test. The parts within a question may not have equal weight. For calculations, show all your work in the spaces provided after each part. Pay particular attention to the proper use of units. Be sure your final answer is rounded to the correct number of significant figures. Make sure your work is legible. Illegible work will receive a grade of zero.

Question 1 [10 POINTS]

A bar of solid Zn is placed into a solution containing aqueous copper (I) sulfate. A reaction occurs; aqueous zinc sulfate and solid Cu atoms form.

$Cu^{+}\ SO_4^{2-}$

$Zn^{2+}\ SO_4^{2-}$

A. Write and balance this reaction. **[3 POINTS]**

$$Zn(s) + Cu_2SO_4(aq) \rightarrow 2\,Cu(s) + ZnSO_4(aq)$$

$\varnothing$ $\quad +1, +6, -2$ $\quad \varnothing$ $\quad +2, +6, -2$

B. What type of reaction is this? **[1 POINT]**

single replacement

C. Write the oxidation numbers for each element in the reaction. You may rewrite the whole reaction below with the oxidation numbers labelled, or ***neatly*** label them above. **[2 POINTS]**

D. Which species gains electrons in this reaction? Which species loses electrons? **[2 POINTS]**

Cu gains electrons

Zn loses electrons

E. Which species is oxidized in this reaction? Which species is reduced? **[2 POINTS]**

Zn is oxidized

Cu is reduced