

Name:

Date:

Period:

Seat #:

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**Assigning oxidation numbers:**

Determine the oxidation number of the underlined element.

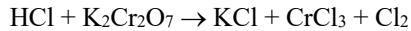
- |                              |                              |   |  |
|------------------------------|------------------------------|---|--|
| 1. <u>Be</u> Cl <sub>2</sub> | 2. <u>N</u> O                | 3. Na <sub>2</sub> <u>S</u> O <sub>3</sub>    | 4. H <sub>2</sub> <u>Q</u> <sub>2</sub>        |
| 5. Ag <u>Br</u>              | 6. <u>Au</u> Cl <sub>3</sub> | 7. H <u>N</u> O <sub>3</sub>                  | 8. H <sub>2</sub> <u>Sn</u> O <sub>3</sub>     |
| 9. <u>S</u> O <sub>3</sub>   | 10. <u>U</u> F <sub>6</sub>  | 11. Ba <u>Cr</u> O <sub>4</sub>               | 12. Ca <u>Se</u> O <sub>4</sub>                |
| 13. H <u>I</u>               | 14. H <sub>2</sub> <u>Se</u> | 15. K <sub>2</sub> P <u>t</u> Cl <sub>6</sub> | 16. <u>Ni</u> SO <sub>4</sub>                  |
| 17. <u>N</u> H <sub>3</sub>  | 18. H <u>Cl</u> O            | 19. <u>N</u> H <sub>4</sub> Cl                | 20. (NH <sub>4</sub> ) <sub>2</sub> <u>T</u> e |

- |           |           |           |           |
|-----------|-----------|-----------|-----------|
| 1.        | 2.        | 3.        | 4.        |
| 5. _____  | 6. _____  | 7. _____  | 8. _____  |
| 9. _____  | 10. _____ | 11. _____ | 12. _____ |
| 13. _____ | 14. _____ | 15. _____ | 16. _____ |
| 17. _____ | 18. _____ | 19. _____ | 20. _____ |

**The Half-Reaction Method:**

1. Write the equation as two half-reactions. Include the particles (atoms, ions, molecules) that are involved in change of oxidation state.
2. Balance each half-reaction with respect to atoms and charges; first atoms other than H and O, then O with H<sub>2</sub>O and H with H<sup>+</sup>, and ionic charges with electrons (e<sup>-</sup>).
3. Equalize the number of electrons lost in the oxidation half-reaction with the number of electrons gained in the reduction half-reaction.
4. Add the two half-reactions to form a balanced net ionic equation.

[a]



14, 1, 2, 2, 2, 7H<sub>2</sub>O

Reduction half-reaction

Oxidation half-reaction

Overall:

[b]



5, 1, 8, 5, 1, 1, 4H<sub>2</sub>O

Reduction half-reaction

Oxidation half-reaction

Overall:

[c]	$\text{CuS} + \text{NO}_3^- \rightarrow \text{Cu}^{2+} + \text{S} + \text{NO}$	
Reduction half-reaction		Oxidation half-reaction
Overall:		

**Balance the following redox reactions in acidic solutions:**

