

Name _____ Block: _____ Date: _____

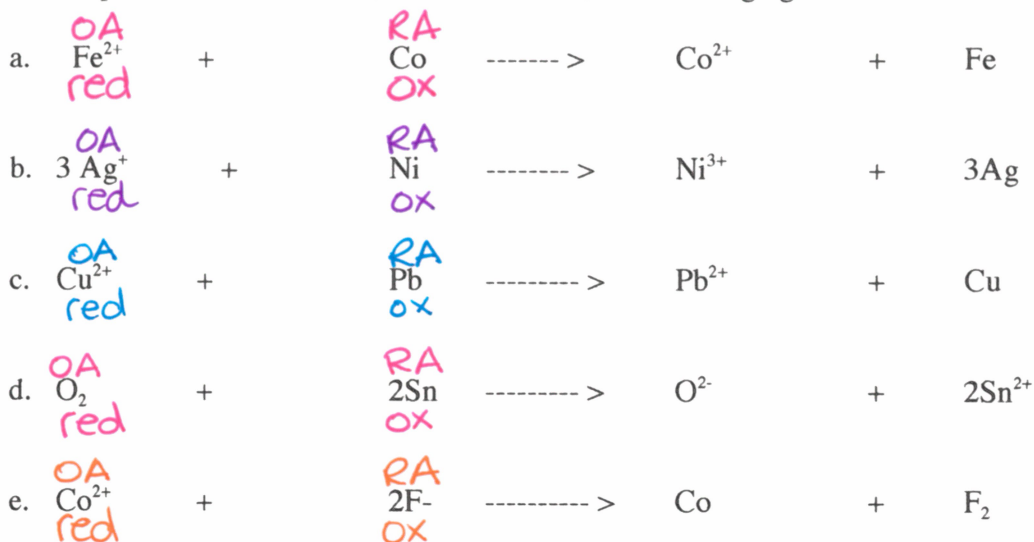
Chemistry 12
INTRO TO REDOX REACTIONS

KEY

1. Define the following:

- a. Oxidation *- when a species loses e⁻*
- b. Reduction *when a species gains e⁻*
- c. Oxidizing Agent *- species being reduced (gains e⁻)*
- d. Reducing Agent *- species being oxidized (loses e⁻)*

2. Label the species that is reduced, that is oxidized, the reducing agent and the oxidizing agent.

3. In question 3a, which species loses electrons? Co loses 2e⁻4. In question 3b, which species gains electrons? Ag⁺ gains 1e⁻

5. In each of the following reactions, identify the oxidizing agent and the reducing agent.



6. State the oxidation number of each of the elements that is underlined.

- | | | |
|--|---|---|
| a) <u>N</u> H ₃ <u>3-</u> | i) K ₂ <u>S</u> O ₄ <u>6+</u> | q) K ₂ <u>Cr</u> ₂ O ₇ <u>6+</u> |
| b) Zn <u>S</u> O ₃ <u>4+</u> | j) Na ₂ <u>O</u> ₂ <u>1-</u> *peroxide | r) <u>N</u> H ₄ ⁺ <u>3-</u> |
| c) <u>Na</u> | k) Na <u>I</u> O ₃ <u>5+</u> | s) <u>Fe</u> O <u>2+</u> |
| d) Ag <u>N</u> O ₃ <u>5+</u> | l) H ₂ <u>S</u> O ₄ <u>6+</u> | t) Si <u>O</u> ₄ ⁴⁻ <u>4+</u> |
| e) <u>S</u> O ₂ <u>4+</u> | m) <u>Al</u> (OH) ₃ <u>3+</u> | u) <u>Cl</u> O ₃ ⁻ <u>5+</u> |
| f) H <u>P</u> O ₃ ²⁻ <u>3+</u> | n) <u>Cl</u> ₂ <u>0</u> | v) Na <u>H</u> <u>1-</u> |
| g) <u>Mn</u> O ₂ <u>4+</u> | o) <u>Cl</u> O ₄ ⁻ <u>7+</u> | |
| h) <u>Pb</u> O ₂ <u>4+</u> | p) K ₂ <u>Cr</u> ₂ O ₄ <u>3+</u> | |

7. What is the oxidation number of carbon in each of the following substances?

- | | |
|------------------------------|--|
| a) CO <u>2+</u> | c) C <u>0</u> |
| b) CO ₂ <u>4+</u> | d) CO ₃ ²⁻ <u>4+</u> |

8. Determine if each of the following changes is oxidation, reduction or neither.

- | | |
|--|----------------|
| <u>4+</u> SO ₃ ²⁻ -----> <u>6+</u> SO ₄ ²⁻ | <u>ox</u> |
| <u>2+</u> CaO -----> <u>0</u> Ca | <u>red</u> |
| <u>6+</u> CrO ₄ ²⁻ -----> <u>6+</u> Cr ₂ O ₇ ²⁻ | <u>neither</u> |
| <u>6+</u> CrO ₄ ²⁻ -----> <u>3+</u> Cr ³⁺ | <u>red</u> |
| <u>1-</u> 2I ⁻ -----> <u>0</u> I ₂ | <u>ox</u> |
| <u>5+</u> IO ₃ ⁻ -----> <u>0</u> I ₂ | <u>red</u> |
| <u>7+</u> MnO ₄ ⁻ -----> <u>2+</u> Mn ²⁺ | <u>red</u> |
| <u>3+</u> ClO ₂ ⁻ -----> <u>1+</u> ClO ⁻ | <u>red</u> |