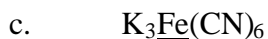


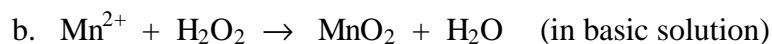
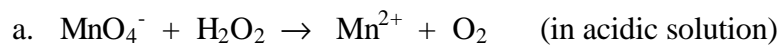
**Chem 151 Pre-lab Practice 3B**  
**Experiment 3: REDOX OR NOT?**  
*(see next page for answers)*

1. Give oxidation numbers for the underlined atoms in the following compounds/ions.



2. For the following reactions,

- i) identify the oxidizing agent,
- ii) write the balanced oxidation half reactions and reduction half reactions,
- iii) write the balanced overall reactions.



3. When aluminum metal is oxidized, what is it converted to?

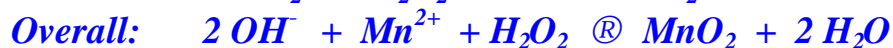
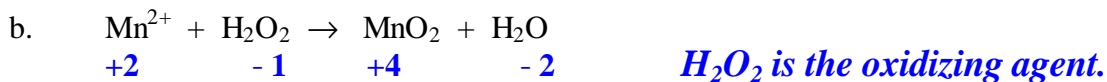
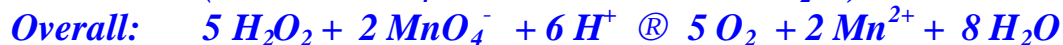
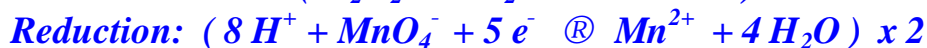
4. Based on the ground state electron configuration of vanadium, what is its highest possible oxidation number and its lowest possible oxidation number?

5. When  $\text{VO}_2^+$  is reduced, what would be the oxidation number of vanadium in the product?

### Answers of Pre-Lab Practice 3

1. a.  $\text{K}\underline{\text{I}}\text{O}_3$       ***I: +5***                      b.  $\text{Rb}\underline{\text{Sb}}\text{O}_3$       ***Sb: +5***  
c.  $\text{K}_3\underline{\text{Fe}}(\text{CN})_6$       ***Fe: +3***                      d.  $\underline{\text{C}}\text{H}_4$       ***C: -4***  
e.  $\underline{\text{O}}\text{F}_2$       ***O: +2***                      f.  $\underline{\text{Fe}}_3\text{N}_2$       ***Fe: +2***

2.



3. ***When aluminum metal is oxidized, it becomes Al<sup>3+</sup>, because +3 is the only stable oxidation state of aluminum ion.***
4. ***The ground state electron configuration of V is: [Ar] 3d<sup>3</sup> 4s<sup>2</sup>***  
***The highest oxidation number is +5 (when it loses 5 electrons to take the stable electron configuration of Argon).***  
***The lowest oxidation number is zero when it is an element.***
5. ***Vanadium has many stable oxidation states. When VO<sub>2</sub><sup>+</sup> is reduced, theoretically speaking, the possible oxidation states are +4, +3, +2, +1, and zero. However, it needs a very strong reducing agent to reduce vanadium to +1 or zero. Practically, this has to be achieved by electrolytic reduction.***