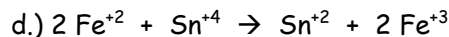
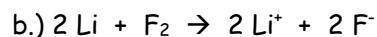
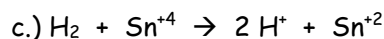
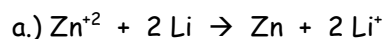
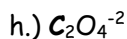
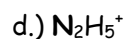
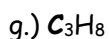


Oxidation Numbers and Spontaneity

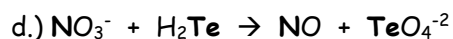
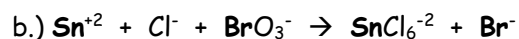
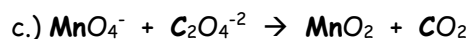
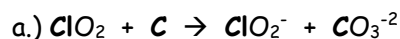
1.) In the following reactions, indicate which species are being oxidized and reduced, as well as label the oxidizing agent and the reducing agent.



2.) Calculate the oxidation number for **bold type** atom.



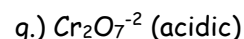
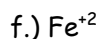
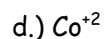
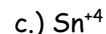
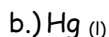
3.) Determine the oxidation number for the bold species for each reaction, and determine which species is being oxidized.



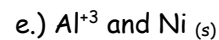
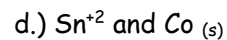
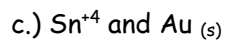
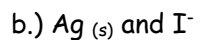
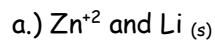
4a.) Which of Cl_2 , ClO_4^- , Cl^- , ClO_3^- , or Cl_2O is the product when ClO_2^- is reduced?

b.) Which of NO_3^- , N_2 , NO_2^- , N_2O , or N_2O_3 can be produced by the oxidation of NO ?

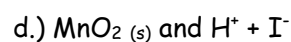
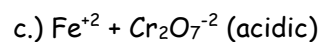
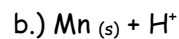
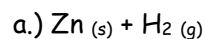
5.) Which of the below chemicals can be oxidized, reduced, both or neither.



6.) Predict whether the following reactions will occur or not and write out the reaction if it occurs.



7.) Which of the reactants below will react, and if they will write the products.



8a.) Which of the following will act as an oxidizer when mixed with Co? Cr, I₂, Al, and Fe⁺³

b.) Which of the following will act as a reducer when mixed with Ag⁺? H₂, Cl₂, Hg⁺², and H₂O₂

c.) Which substance(s) can be oxidized by I₂ but no by acidic SO₄⁻²?

d.) Which substance(s) can e reduced by I⁻ but not by Fe⁺²?

9.) If an electrochemical cell is made by joining the two half reactions of 1 M Sn(NO₃)₂ with a tin electrode and 1 M Fe(NO₃)₂ with an iron electrode. Over time what happens to the Sn⁺² and the Fe⁺²?

10.) Using the information given on the following four half-reactions, and knowing that F⁺² reacts with D_(s), E_(s), and G_(s), no reaction occurs between D⁺² and any of the metals, and G⁺² only reacts with D_(s), arrange the four half-reactions in decreasing strength as oxidizing agents.

