1. [NH3] = 0.200 M, [N2] = 0.150 M

2. 60%

3. 5.1 x 10^(-3)

4. [Fe3+] at pH=7 (in M):4E-17±1E-17 [Fe3+] at pH=10 (in M): 4E-26±1E-26

5. Minimum: 9.0±0.1 Maximum: 9.5±0.1

6. 10.69±.011

7. 4.3e-4±0.2e-4

8. N2O4 5.3±0.1 NO2 7.6±0.1

9. 1.79 × 10E-5

10. 2

11. A

12. N, Kr, Cl

13. less soluble

14. NaNO3, KI, KNO3

15. a

16. purple

17. No

18. [Pb2+] =0.0000067 M
[OH^-] = 0.0000134 M
Ksp =1.20 x 10^(-15) 19. 2-

19. 2-

20. 2+

21. 1-

22. a) $3\ C_3H_5(OH)_3 + 14\ KMnO_4 \rightarrow 14\ MnO_2 + 14\ KOH + 9\ CO_2 + 5\ H_2O$
b) $2\ KMnO_4 + (cold)\ 2\ H_2SO_4 \rightarrow Mn_2O_7 + H_2O + 2\ KHSO_4$

23. Potassium bisulfate and Manganese heptoxide (or manganese (VII) oxide)

24. It decomposes to permanganic acid

25. a) $4Al(s) + 3O_2(g) + 6H_2O(l) + 4OH^-(aq) \rightarrow 4[Al(OH)_4]^-(aq)$
b) $3Zn(s) + 2NO_3^-(aq) + 4H_2O(l) \rightarrow 3Zn^{2+}(aq) + 2NO(g) + 8OH^-(aq)$

26. a) $2\ H_2O_2(aq \longrightarrow O_2(g) + 2\ H_2O(l)$
b) $2\ MnO_4^-(aq) + 5\ C_2O_4^{2-}(aq) + 16\ H^+(aq) \longrightarrow 2\ Mn^{2+}(aq) + 10\ CO_2(g) + 8\ H_2O(l)$
c) $2\ MnO_4^-(aq) + 3\ CH_3CH_2OH(aq) \longrightarrow 2\ MnO_2(s) + 3\ CH_3CHO(aq) + 2\ H_2O(l) + 2\ OH^-(aq)$

27. The iodide reacts with persulfate in a slow step to produce iodine and sulfate. At that point, the thiosulfate reacts with the iodine formed to produce iodide.