

Redox Reactions Review

① (a) reduction (b) oxidation (c) oxidation (d) reduction

② oxidized reduced

(a) Br Cl

(b) Ce Cu

(c) Zn O

③ oxidizing agent reducing agent

(a) I₂ Mg

(b) H Na

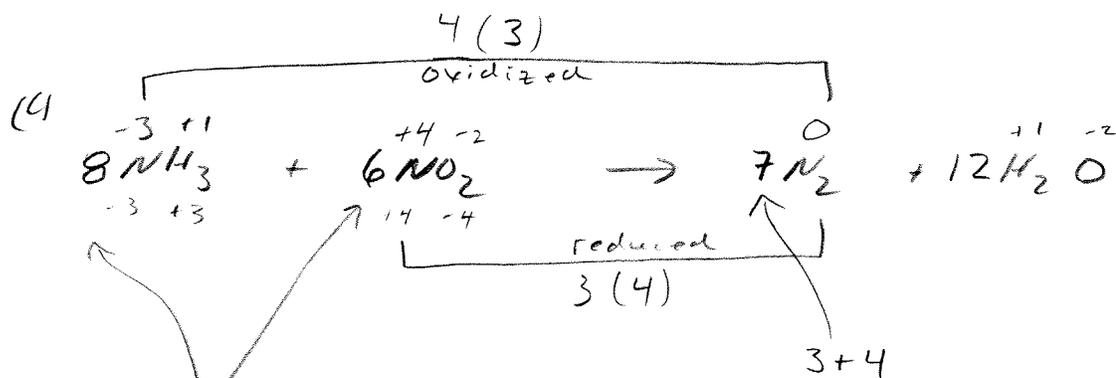
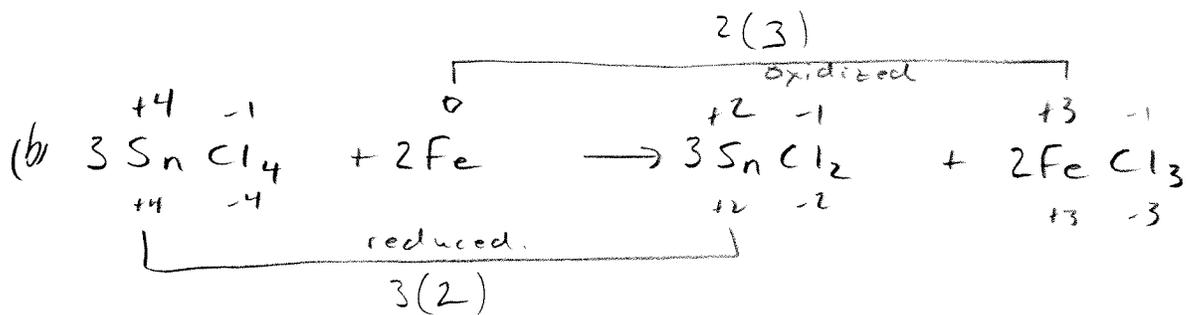
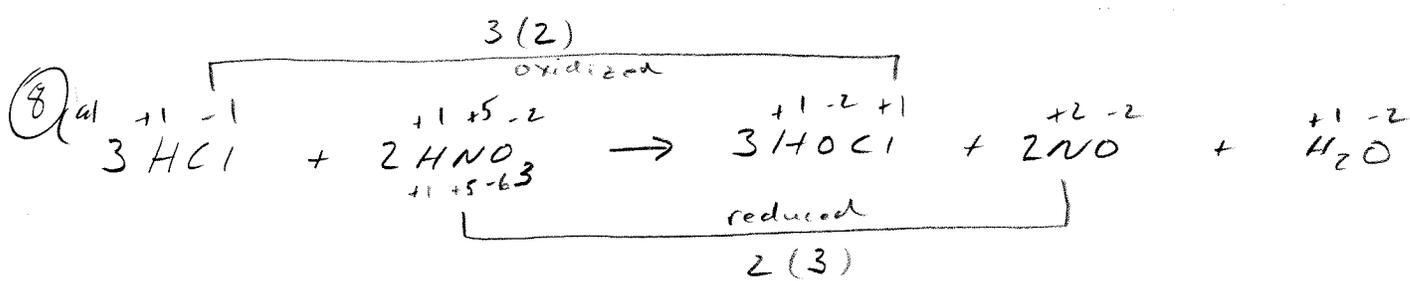
(c) Cl₂ H₂S

④ (a) $\begin{array}{ccc} +1 & \textcircled{+7} & -2 \\ \text{Na} & \text{Cl} & \text{O}_4 \\ +1 & -7 & -8 \end{array}$ (b) $\begin{array}{ccc} +3 & \textcircled{+5} & -2 \\ \text{Al} & \text{P} & \text{O}_4 \\ +3 & +5 & -8 \end{array}$ (c) $\begin{array}{ccc} +1 & \textcircled{+3} & -2 \\ \text{H} & \text{N} & \text{O}_2 \\ +1 & +3 & -4 \end{array}$

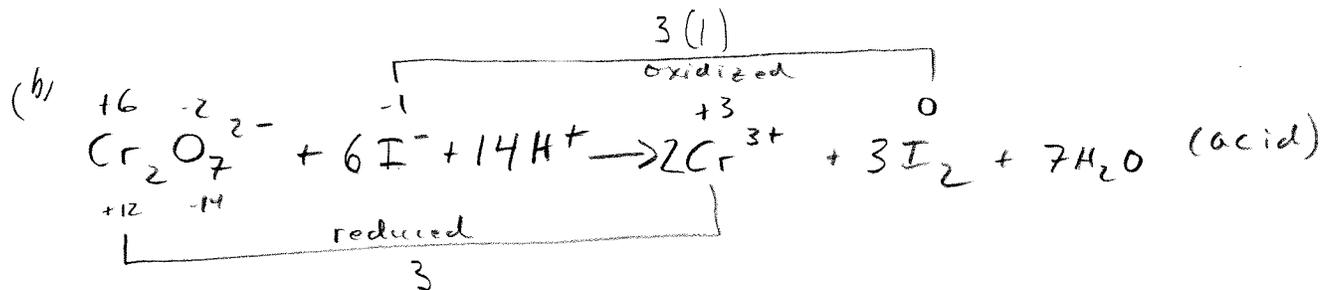
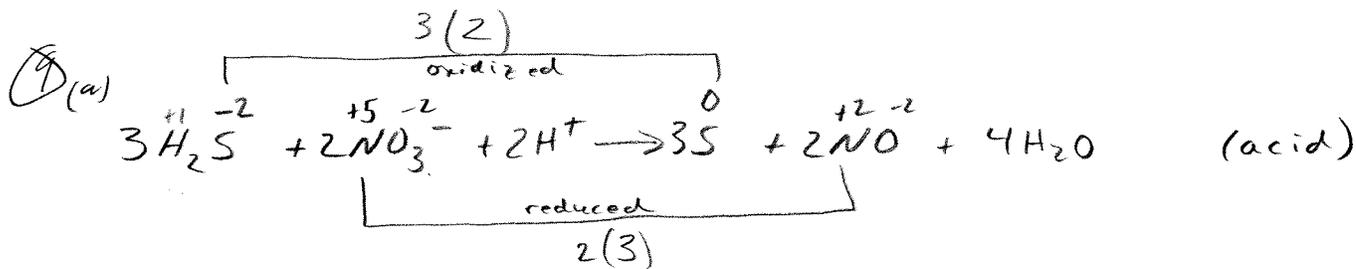
⑤ (a) $\begin{array}{ccc} \textcircled{+9} & -2 & \\ \text{N} & \text{H}_4 & ^+ \\ +9 & -8 & \end{array}$ (b) $\begin{array}{ccc} \textcircled{+5} & -2 & 3- \\ \text{As} & \text{O}_4 & \\ +5 & -8 & \end{array}$ (c) $\begin{array}{ccc} \textcircled{+6} & -2 & 2- \\ \text{Cr} & \text{O}_4 & \\ +6 & -8 & \end{array}$

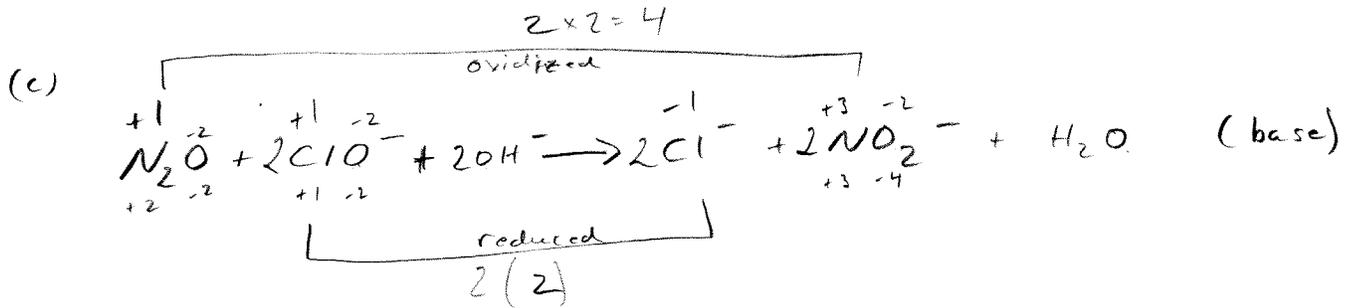
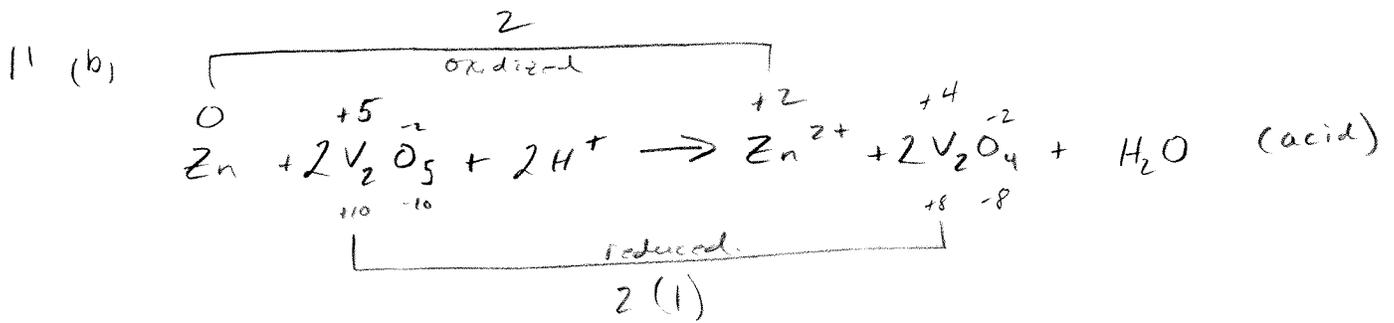
⑥ (a) $\begin{array}{ccc} \textcircled{+5} & -2 & \\ \text{Sb} & \text{O}_5 & \\ +10 & -10 & \end{array}$ (b) $\begin{array}{ccc} +1 & \textcircled{+5} & 2 \\ \text{H} & \text{N} & \text{O}_3 \\ +1 & +5 & -6 \end{array}$ (c) $\begin{array}{ccc} +2 & \textcircled{-1} & \\ \text{Ca} & \text{N}_2 & \\ +2 & -2 & \end{array}$ (d) $\begin{array}{ccc} +2 & \textcircled{+6} & -2 \\ \text{Cu} & \text{W} & \text{O}_4 \\ +2 & +6 & -8 \end{array}$

⑦ (a) $\begin{array}{ccc} \textcircled{+7} & -2 & \\ \text{I} & \text{O}_4 & \\ +7 & -8 & \end{array}$ (b) $\begin{array}{ccc} \textcircled{+7} & -2 & - \\ \text{Mn} & \text{O}_4 & \\ +7 & -8 & \end{array}$ (c) $\begin{array}{ccc} \textcircled{+3} & -2 & 2- \\ \text{B}_4 & \text{O}_7 & \\ +12 & -14 & \end{array}$ (d) $\begin{array}{ccc} \textcircled{-3} & +1 & - \\ \text{N} & \text{H}_2 & \\ -3 & +2 & \end{array}$



We need to double the coefficient because we have 2 N on the product side.





- 12
- | | oxidized | reduced |
|-----|----------|---------|
| (a) | Ga | Br |
| (b) | Zn | H |
| (c) | Mg | N |

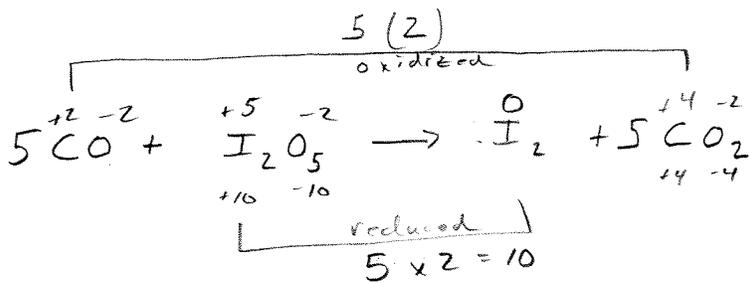
- 13
- | | oxidizing agent | reducing agent |
|-----|-----------------|------------------|
| (a) | Cl ₂ | H ₂ S |
| (b) | N ₂ | H ₂ |
| (c) | I ₂ | Na |

- 14
- | | | | | | | | |
|-----|---|-----|---|-----|--|-----|---|
| (a) | $\begin{array}{c} +2 \quad (+6) \quad -2 \\ \text{Ca} \quad \text{Cr} \quad \text{O}_4 \\ +2 \quad +6 \quad -8 \end{array}$ | (b) | $\begin{array}{c} +1 \quad +1 \quad (+6) \quad -2 \\ \text{Na} \quad \text{H} \quad \text{S} \quad \text{O}_4 \\ +1 \quad +1 \quad +6 \quad -8 \end{array}$ | (c) | $\begin{array}{c} (+3) \quad -2 \\ \text{N} \quad \text{O}_2 \\ +3 \quad -4 \end{array}$ | (d) | $\begin{array}{c} (+5) \quad -2 \\ \text{Br} \quad \text{O}_3 \\ +5 \quad -6 \end{array}$ |
|-----|---|-----|---|-----|--|-----|---|

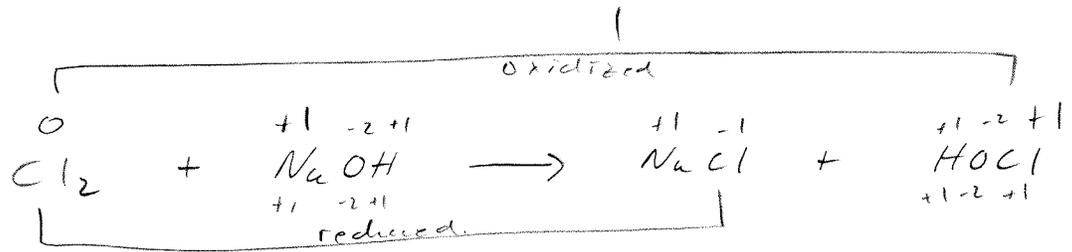
- 15
- | | | | | | | | | | | | |
|-----|--|-----|---|-----|--|-----|--|-----|--|-----|--|
| (a) | $\begin{array}{c} (-3) \quad +1 \\ \text{N} \quad \text{H}_3 \\ -3 \quad +3 \end{array}$ | (b) | $\begin{array}{c} +1 \quad +2 \quad (-3) \\ \text{K} \quad \text{C} \quad \text{N} \\ +1 \quad +2 \quad -3 \end{array}$ | (c) | $\begin{array}{c} (-2) \quad +1 \\ \text{N}_2 \quad \text{H}_4 \\ -4 \quad +4 \end{array}$ | (d) | $\begin{array}{c} (+5) \quad -2 \\ \text{N} \quad \text{O}_3 \\ +5 \quad -6 \end{array}$ | (e) | $\begin{array}{c} (+1) \quad -2 \\ \text{N}_2 \quad \text{O} \\ +2 \quad -2 \end{array}$ | (f) | $\begin{array}{c} (+3) \quad -1 \\ \text{N} \quad \text{F}_3 \\ +3 \quad -3 \end{array}$ |
|-----|--|-----|---|-----|--|-----|--|-----|--|-----|--|

- 16
- | | | | | | |
|-----|---|-----|---|-----|--|
| (a) | $\begin{array}{c} +2 \quad +3 \quad -2 \\ \text{Fe} \quad \text{Cr}_2 \quad \text{O}_4 \\ +2 \quad +6 \quad -8 \end{array}$ | (b) | $\begin{array}{c} +3 \quad +6 \quad -2 \\ \text{Au}_2 \quad (\text{SeO}_4)_3 \\ +6 \quad +18 \quad -24 \end{array}$ | (c) | $\begin{array}{c} +2 \quad +2 \quad -3 \\ \text{Ni} \quad (\text{CN})_2 \\ +2 \quad +4 \quad -6 \end{array}$ |
|-----|---|-----|---|-----|--|

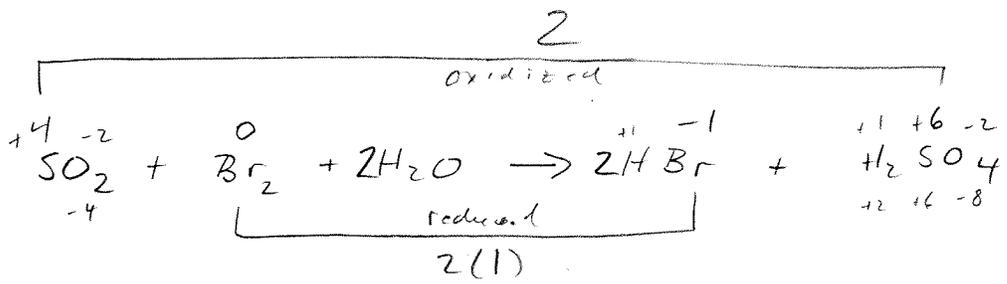
(17) (a)



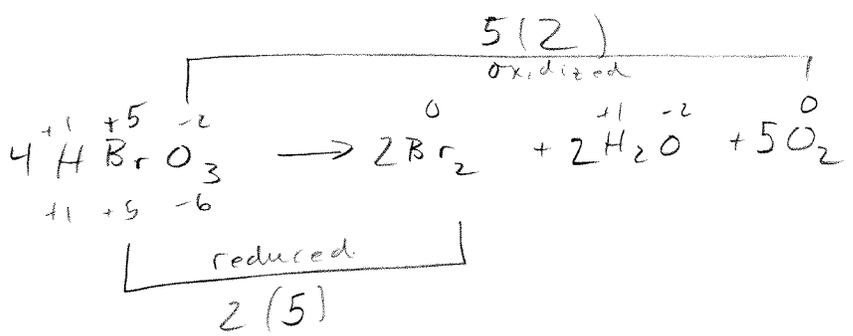
(b)



(c)

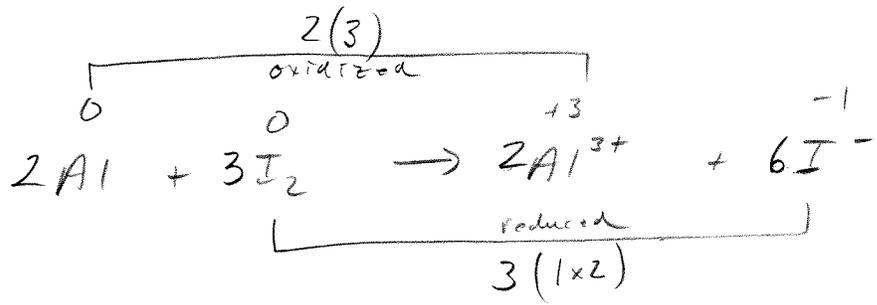


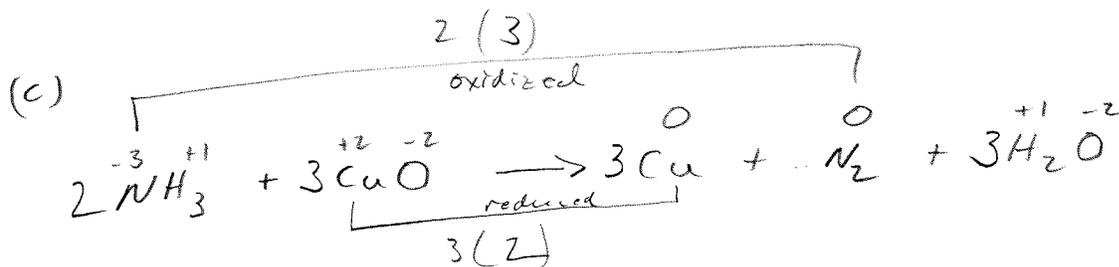
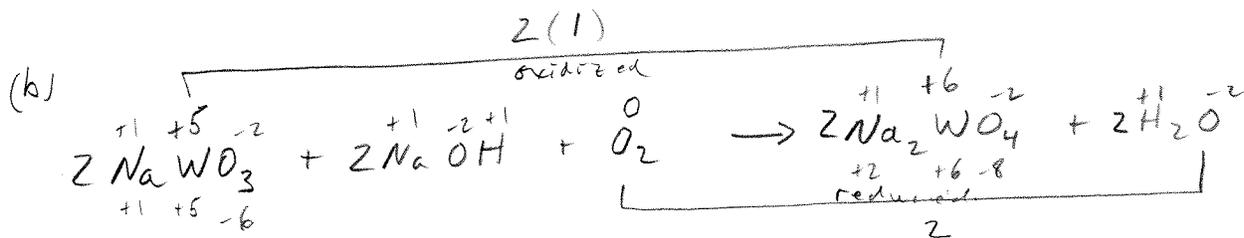
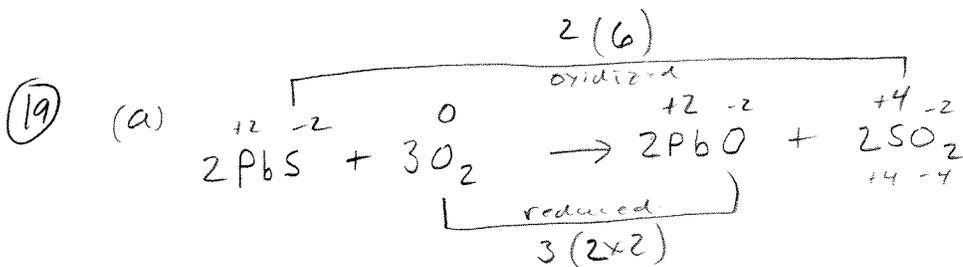
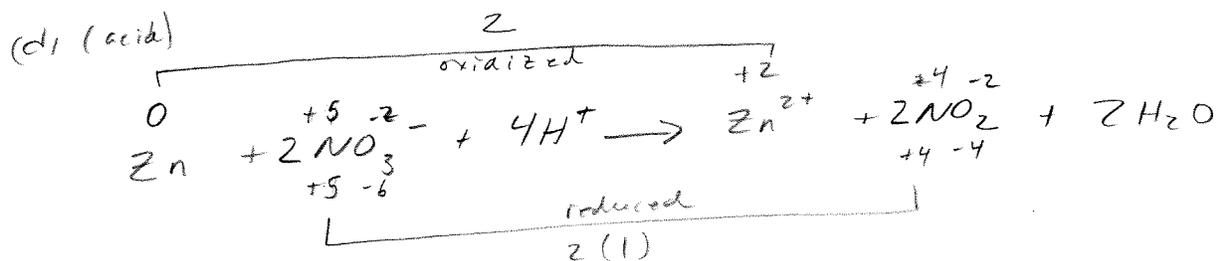
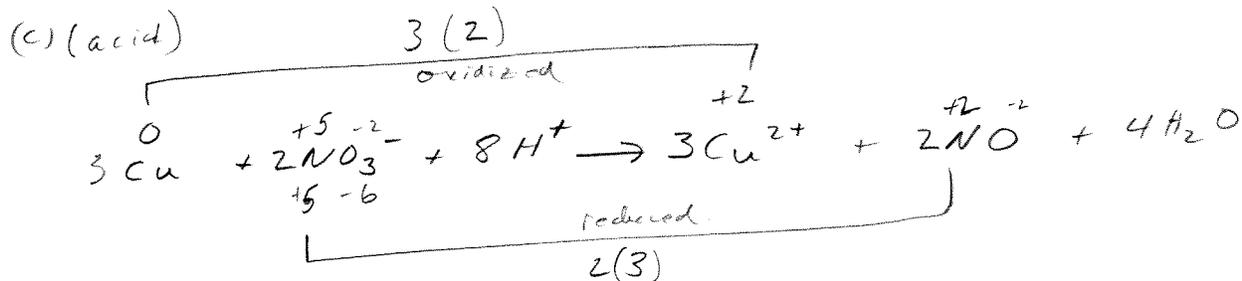
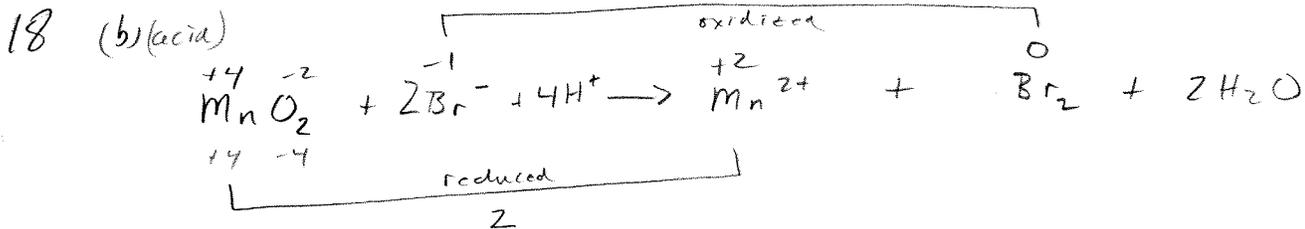
(d)



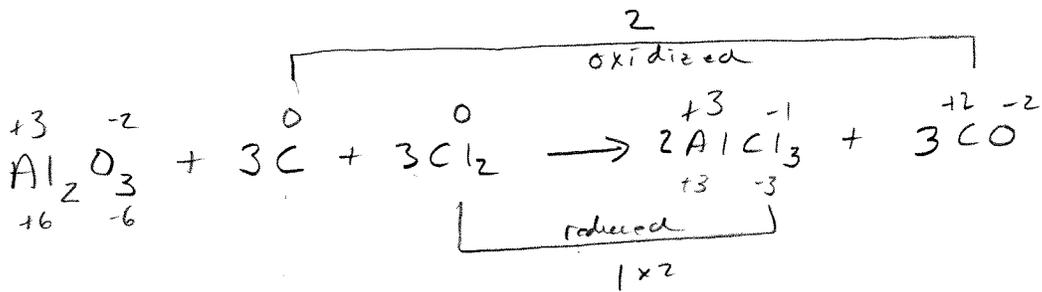
(18)

(a)

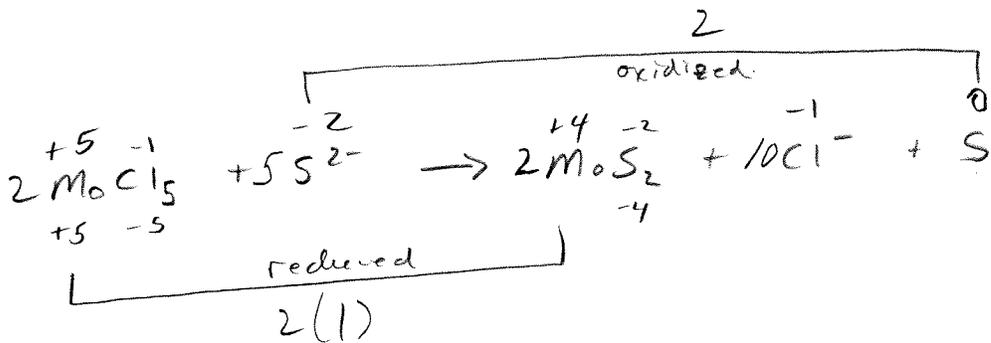




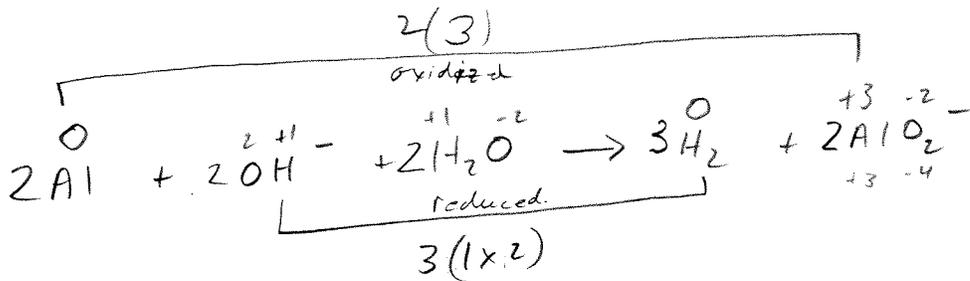
19 (d)



20 (a)



(b)



(c)

