

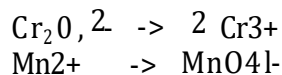
BALANCING REDOX REACTIONS

ACIDIC SOLUTIONS

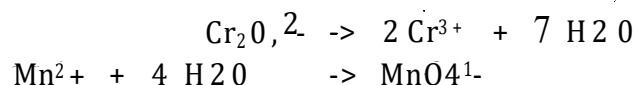
1. Divide reaction into half reactions.
 $\text{Cr}_2\text{O}_7^{2-} + \text{Mn}^{2+} \rightarrow \text{Cr}^{3+} + \text{MnO}_4^{1-}$



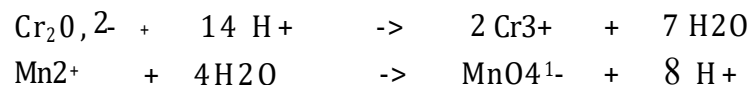
2. Balance all other elements except for H & O.



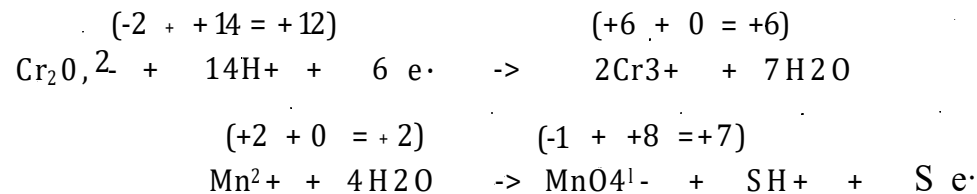
3. Balance O by adding H₂O.



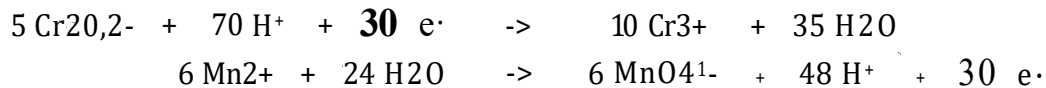
4. Balance H by adding H⁺.



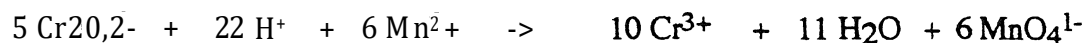
5. Balance charge by adding electrons (e⁻) to the side that has more positive charge;



6. }/fake e⁻ gain = e⁻ loss. Multiply first reaction by 5 so (6 x 5 e⁻ = 30 e⁻) and the second reaction by 6 so (5 x 6 e⁻ = 30 e⁻).

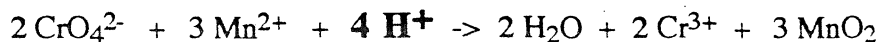


7. Add reactions together and cancel like species on both sides of the reaction.

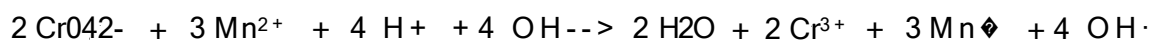


BASIC SOLUTIONS

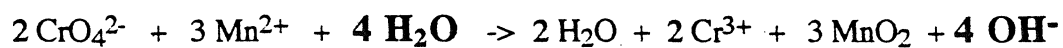
8. If the reaction SPECIFICALLY states that the reaction occurs in basic solution, FIRST follow steps 1 through 7 for acidic solutions. THEN, convert to basic solutions by adding the same quantity of hydroxide ion (OH-) to both sides of the reaction to equal the quantity of hydrogen ion present (H⁺).



THUS:



9. Combine the H⁺ and OH⁻ ion together to form water.



10. Cancel out water to obtain final reaction.

