$25g\ K_2CO_3$ 100ml of .500M HCl

2.40L @ 20°C + 752 torr $V_{pressure} = 22.34$ torr

Liters CO_2? Increase pressure H_2O? Net Ionic?

- Balance reaction

$$1K_2CO_{3(s)} + 2HCl_{(aq)} \rightarrow 2KCl_{(aq)} + 1H_2O_{(l)} + 1CO_{2(g)}$$

Net Ionic

↳ $K_2CO_{3(s)} + H^+ + \cancel{Cl^-} \rightarrow K^+ + \cancel{Cl^-} + H_2O_{(l)} + CO_{2(g)}$

- Determine limiting reactant

$$\frac{25g\ K_2CO_3}{138.0g\ K_2CO_3} \left| \frac{1\ mol\ K_2CO_3}{1\ mol\ K_2CO_3} \right| \frac{1\ mol\ CO_2}{1\ mol\ K_2CO_3} = .181 \text{ moles } CO_2$$

$$\frac{.100L\ HCl}{1L} \left| \frac{.500\ moles\ HCl}{2\ moles\ HCl} \right| \frac{1\ mol\ CO_2}{2\ moles\ HCl} = .025 \text{ moles } CO_2$$

HCl is limiting reactant

Use LR moles to solve for Volume.

$$V = \frac{nrt}{P} \Rightarrow \frac{(.025)(.08207)(293)}{\left(\frac{752 - 22.34}{760}\right)} = .626\ L\ CO_2 \text{ is produced}$$

remember to subtract out H_2O vapor & convert to torr