

**Task:**

at a certain temperature and pressure, .20 mol of CO<sub>2</sub> has a volume of 3.1L. a 3.1L sample of hydrogen at the same temperature and pressure--

**Solution:**

3.1L sample of hydrogen at the same temperature and pressure contains the same amount of H<sub>2</sub> (0.20 mol) as CO<sub>2</sub> does.

That can be proved with writing The Ideal Gas equation

$$p \cdot V = n \cdot R \cdot T$$

Where p - pressure

V - volume of the gas

n - the amount of the gas (mol)

R - universal gas constant

T - temperature

If the temperature and pressure don't change and the volume is the same, then  $p_1 \cdot V_1 = p_2 \cdot V_2$

and  $n_1 \cdot R \cdot T = n_2 \cdot R \cdot T$

So  $n_1 = n_2$ , or  $n(\text{CO}_2) = n(\text{H}_2)$

**Answer:** 3.1L sample of hydrogen at the same temperature and pressure contains the same amount of H<sub>2</sub> (0.20 mol).