

Phosphorus and Chlorine

a) 10g of phosphorus was reacted with chlorine. It was found that 11.6dm³ of chlorine were used in the reaction. Work out the equation for the reaction occurring.

$$\text{amount P} = \text{mass/rmm}$$

$$= 10 / 31$$

$$= 0.323 \text{ mol}$$

$$\text{amount Cl}_2 = \text{vol.} / 24\text{dm}^3$$

$$= 11.6 / 24$$

$$= 0.484 \text{ mol}$$

	(P)		(Cl ₂)		
moles	0.323		0.484		<i>(divide by smallest)</i>
ratio	1	:	1.5		
equation	P	+	1½Cl₂	→	PCl₃

b) 5g of PCl₃ was reacted with chlorine. It was found that 873cm³ of chlorine were used in the reaction. Work out the equation for the reaction occurring.

$$\text{amount PCl}_3 = \text{mass/rmm}$$

$$= 5 / 137.5$$

$$= 0.0364 \text{ mol}$$

$$\text{amount Cl}_2 = \text{vol.} / 24000\text{cm}^3$$

$$= 873 / 24000$$

$$= 0.0364 \text{ mol}$$

	(PCl ₃)		(Cl ₂)		
moles	0.0364		0.0364		
ratio	1	:	1		
equation	PCl₃	+	Cl₂	→	PCl₅