Calculate the empirical formula of the compound containing: potassium 26.6%, chromium 35.4%, oxygen 38%.

Solution

26.6 g K $\cdot \frac{1\ mol}{39.098\ g} = 0.6803\ mol\ K$

35.4 g Cr $\times \frac{1\ mol}{51.996\ g} = 0.6808\ mol\ Cr$

38g O $\times \frac{1\ mol}{15.99\ g} = 2.3764\ mol\ O$

$\frac{0.6803\ mol\ K}{0.6803} \div \frac{0.6808\ mol\ Cr}{0.6803} \div \frac{2.3764\ mol\ O}{0.6803} = 1\ mol\ K \div 1.0007\ mol\ Cr \div 3.4931\ mol\ O \rightarrow$

$\rightarrow 2\ mol\ K \div 2.0014\ mol\ Cr \div 6.9862\ mol\ O$

Answer: empirical formula $= K_2Cr_2O_7$