two oxides of a metal contain 46.67% and 62.93% of the metal.show that these results illustrates the law of multiple proportions.

Solution:

Dalton's law of multiple proportions:

If two elements form more than one compound between them, then the ratios of the masses of the second element which combine with a fixed mass of the first element will be ratios of small whole numbes.

One can calculate the mass percentage of oxygen in two oxides:

$\omega_1(O) = 100 - 46.67 = 53.33$ (%)

$\omega_2(O) = 100 - 62.93 = 37.07$ (%)

The ratio of metal and oxygen masses in two oxides:

$\omega_1(Me) : \omega_1(O) = 46.67 : 53.33 = 1 : 1.14$

$\omega_2(Me) : \omega_2(O) = 62.93 : 37.07 = 1 : 0.59$

The ration of oxygen masses: 1.14 : 0.59 = 1 : 2.