Answer on Question #42810 - Chemistry - Physical Chemistry

Question:

A gaseous oxide contains 30.4% nitrogen, 1 molecule of which have 1 atom of nitrogen. What is the density of oxide relative to oxygen?

Answer:

The formula of nitrogen oxide will be NO_x.

% of nitrogen = M(of nitrogen)/M(of nitrogen oxide);

$14/(14 + 16*x) = 0.304$;

$x = 2.00$

It means that molecular formula of nitrogen oxide is NO_2.

The relative density is the ratio between the molecular masses of gases.

$RD_{O2}(NO_2) = M(NO_2)/M(O_2) = 46/32 = 23/16$

Answer: 23/16 ≈ 1.44