20cm³ of carbon monoxide are mixed and sparks with 200cm³ of air containing 21% of oxygen if all the volume are measured at standard temperature and pressure. Calculate the total volume of resulting gases

Solution:

When carbon monoxide are mixed and sparks with air it reacts with oxygen:

$$2CO + O_2 = 2CO_2$$
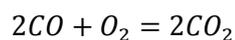
Volume of oxygen in air is:

$V(O_2)$ (cm^3)= 200*0.21 = 42;

As we can see, volume of oxygen in the sample of air is enough for full combustion of carbon monoxide.

Total volume of resulting gases can be calculated as a sum of these two samples minus half volume of carbon monoxide (this is a volume of oxygen that reacts with carbon monoxide)

$V(gases)$ (cm^3) = 200 + 20 − 20/2 = 210;

Answer: 210 cm^3