1 litre of mixture of CO and CO_2 is taken. The mixture is passed through a tube containing red hot charcoal. The volume now becomes 1.6 litre. The volumes are measured under the same conditions. Find the composition of mixture by volume. *(1980)*

Following reaction takes places in tube

$C + CO_2 \longrightarrow 2CO$

Volume of mixture of CO and $CO_2 = 1L$

Let volume of CO_2 in mixture $= x$

$\therefore$ Volume of CO in mixture $= 2x$

$\therefore$ Original volume of CO in mixture $= 1 - x$

Total volume of CO after reaction $= (1 - x) + 2x = 1 + x$

$1 + x = 1.6$ ($\because$ It is given total volume after reaction $= 1.6L$)

$\therefore x = 0.6 L$ $\quad \therefore$ Volume of $CO_2 = 0.6 L$

Volume of CO $= 0.4 L$

$CO_2 : CO = 3 : 2$