

TOPIC

Chemistry – Section III – Question 6

QUESTION

How many moles of air would you need to completely oxidize 1 mol of octane (C_8H_{18}) into CO_2 and H_2O ? Air is approximately 21 mol % O_2 and 79 mol % N_2 .

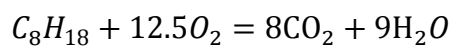
- (A) 2.6
- (B) 3.3
- (C) 12.5
- (D) 59.5

HINT

Write a balanced chemical reaction for the oxidation.

SOLUTION

The balanced chemical reaction is



Thus one mole of octane requires

$$\begin{aligned} 12.5 \text{ moles of } O_2 &= \frac{12.5}{0.21} \\ &= 59.5 \text{ moles of air.} \end{aligned}$$

ANSWER

(D)

CONTRIBUTOR

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