

M1.B

[1]

M2.D

[1]

M3. (a) (i) 0.86 (1)

(ii) total moles = 0.86 + 0.43 + 0.085 = 1.375 (1)

$$\therefore \text{mole fraction of H}_2 = \frac{0.86}{1.375} = 0.625 \text{ (1)}$$

(0.62 - 0.63)

Conseq on (i)

(iii) pp = mole fractⁿ × total P (1)
= 0.625 × 1.75 × 10⁴
= 1.09 × 10⁴ (kPa) (1)

or 1.1(0)

Ignore units

Conseq on (ii)

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(b) (i) $K_p = \frac{P_{\text{CH}_3\text{OH}}}{P_{\text{H}_2}^2 \times P_{\text{CO}}} \text{ (1)}$
Penalise []

(ii) $K_p = \frac{2710}{(12300)^2 \times (7550)} = 2.37 \text{ (2.4)} \times 10^{-9} \text{ (1)}$

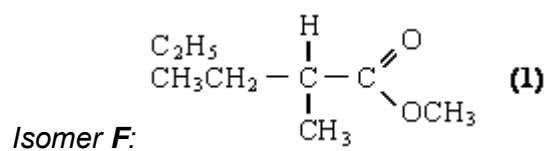
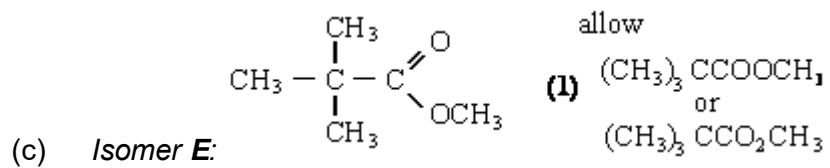
OR 2.37×10^{-15}

Units: kPa^{-2} (1)

or Pa^{-2}

not conseq to wrong K_p expression

3



2

[10]

M4.D

[1]