| Question Number | Answer | | Mark |
|---|---|---|---|
| 3(a)(i) | Values of log $P$ correct to 2 d.p. | (1) | |
| | Values of $\frac{1}{T}$ correct to 5 d.p. **Or** Values of $\frac{1}{T}$ correct to 2 d.p. if written in standard form | (1) | |
| | Axes labelled: $y$ as log ($P$ / kPa) and $x$ as $\frac{1}{T}$ / $K^{-1}$ | (1) | |
| | Most appropriate scales chosen | (1) | |
| | Values plotted accurately | (1) | |
| | Best fit line drawn | (1) | 6 |
| 3(a)(ii) | Calculation of gradient using large triangle shown | (1) | |
| | Gradient = $(-)\ 2.2 \times 10^3$ | (1) | |
| | Gradient given to 2 or 3 s.f. **and** negative | (1) | 3 |
| | <u>Example of calculation</u> gradient = $(2.34 - 1.00) / (2.60 - 3.20) \times 10^{-3} = 0.34 / - 0.60 \times 10^{-3}$ $= -2230$ | | |
| 3(a)(iii) | Use of gradient = $(-)\dfrac{X}{2.30k}$ | (1) | |
| | Correct value of $X$       [e.c.f. (a)(ii)] | (1) | |
| | $X$ given to 2 or 3 s.f. | (1) | 3 |
| | <u>Example of calculation</u> $X$ = gradient $\times\ (-2.30k) = -2230 \times (-2.30 \times 1.38 \times 10^{-23}\ J\ K^{-1})$ $= 7.08 \times 10^{-20}$ (J) | | |
| 3(b) | Value of $\frac{1}{T}$ interpolated from graph | (1) | |
| | Correct $T$ calculated | (1) | |
| | Conversion of $T$ to °C, given to 2 or 3 s.f. | (1) | 3 |
| | <u>Example of calculation</u> (Log $P$ = log (100) = 2) $\frac{1}{T} = 2.75 \times 10^{-3}\ K^{-1}$ $T = 1 / 2.75 \times 10^{-3} = 364\ K$ boiling point = $364 - 273 = 91$ (°C) | | |
| **Total for question 3** | | | **15** |