

Related Problems

Electromagnetic radiation of wavelength 242 nm is just sufficient to ionise the sodium atom. Calculate the ionisation energy of sodium in kJ mol^{-1} .

$$\begin{aligned}\text{Energy of sodium } (E) &= \frac{N_A hc}{\lambda} \\ &= \frac{(6.023 \times 10^{23} \text{ mol}^{-1})(6.626 \times 10^{-34} \text{ Js})(3 \times 10^8 \text{ ms}^{-1})}{242 \times 10^{-9} \text{ m}}\end{aligned}$$

$$= 4.947 \times 10^5 \text{ J mol}^{-1}$$

$$= 494.7 \times 10^3 \text{ J mol}^{-1}$$

$$= 494 \text{ kJ mol}^{-1}$$