2 The Stefan-Boltzmann law for the rate of thermal energy emitted per unit surface area of a body is given by

$$\frac{P}{A} = e\sigma T^4 ,$$

where P is the rate of thermal energy emitted, A is the surface area, T is the thermodynamic temperature and e, a dimensionless constant, is the emissivity of the body and σ is the Stefan-Boltzmann constant.

Which is the S.I. base unit for σ?

A $\text{kg s}^{-3}\ \text{K}^{-4}$ **B** $\text{kg s}^{-1}\ \text{K}^{4}$ **C** $\text{W m}^{-2}\ \text{K}^{-4}$ **D** $\text{W m}^{-2}\ ^{\circ}\text{C}^{-4}$