Kareem's Radiation

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Abstract

derive the formula which calculate the radiation power of 1 mole of a sodium atoms due to the earth motion around sun

1 the number of atoms in one mole

the number of atoms in one mole of sodium is equal to the Avogadro number N =$6.02214076 * 10^2 3$

2 the total charge of the sodium atom

the total charge of the sodium atom is equal to 1 (-e) charge of free electron + 11 (e) charge of proton , then the total charge is equal to 10 e

3 larmor formula

The Larmor formula is used to calculate the total power radiated by a non relativistic point charge as it accelerates

$$P = dE/dt$$

$$P = (\frac{2}{3})(\frac{kQ^2a^2}{c^3})$$

4 orbital velocity and acceleration

the orbital velocity calculated by a formula called Vis-viva equation

$$v = \sqrt{MG(\frac{2}{r} - \frac{1}{a})}$$

and the orbital acceleration will be as a follow

$$a = \frac{v^2}{r}$$

$$a = \frac{MG\left(\frac{2}{r} - \frac{1}{a}\right)}{r}$$

5 the power of the radiation which emitted by the single sodium atom which revolves around sun

$$P = (\frac{2}{3})(\frac{kQ^2a^2}{c^3})$$

$$p = (\frac{2}{3})(\frac{k(10e)^2a^2}{c^3}$$

$$P = \frac{2}{3}\ k\ \frac{(10e)^2\mu^2\left(\frac{2}{r} - \frac{1}{a}\right)^2}{r^2c^3}$$

6 the power of the radiation which emitted by sodium atoms which revolves around sun

$$P = \frac{2}{3}\ k\ \frac{(10e)^2\mu^2\left(\frac{2}{r} - \frac{1}{a}\right)^2}{r^2c^3} n.Na$$

since n is the number of moles and Na is Avogadro's number , $\mu isequaltoMG$