Answer on Question #64942 - Chemistry - General Chemistry

Question:
what is the energy associated with a photon of light with 24nm wavelength

Solution:
The equation for the photon energy is following:

$$E = h * c / \lambda$$
Where
E – the photon energy, J;
h – the Planck constant ($6.63*10^{-34}$ J*s);
c – speed of light in vacuum ($3.00*10^8$ m/s);
λ – photon's wavelength, m.

Convert the given wavelength to meters:
1 nm = 10^{-9} m;
24 nm = $24*10^{-9}$ = $2.4*10^{-8}$ m

Do the calculation:
$E = 6.63*10^{-34}$ J*s $* 3.00*10^8$ m/s $/ 2.4*10^{-8}$ m $= 8.29*10^{-18}$ J

Answer:
The energy of a photon is $8.29*10^{-18}$ J