Answer on Question#52466 - Chemistry - Physical Chemistry

(a) Deduce the SI units for the gas constant, R.

In order to derive this, we'll use the ideal gas equation, PV = nRT (i)
From this equation, R = PV/nT (ii)
Now, at NTP conditions (Normal temperature and pressure)
P = 101.325 kPa;
V = 22.4 L; T = 273 K;
n = 1 mole.
Plugging these values in (ii) we get
$R = 101.325 \times 22.4 / (273 \times 1) = 8.313\ kPa*L*K^{-1}*mol^{-1}$

(b) Define the following terms: (1×2) (i) Catalyst (ii) Adsorption

(i) Catalyst – a substance that speeds up a chemical reaction, but is not consumed by the reaction; hence a catalyst can be recovered chemically unchanged at the end of the reaction it has been used to speed up, or catalyze.

(ii) Adsorption – the adhesion of atoms, ions, or molecules from a gas, liquid, or dissolved solid to a surface. This process creates a film of the adsorbate on the surface of the adsorbent.