

بسم الله الرحمن الرحيم

ثوابت قد تحتاج إليها

$e=1.602 \times 10^{-19} \text{ C}$	$\epsilon_0=8.854 \times 10^{-12} \text{ C}^2/\text{N.m}^2$	$k_e = 9 \times 10^9 \text{ N.m}^2/\text{C}^2$
$\mu_0=4\pi \times 10^{-7} \text{ Wb/m.A}$	$c = 3 \times 10^8 \text{ m/s}$	$R = 1.09737 \times 10^7 \text{ m}^{-1}$
$1 \text{ eV} = 1.6 \times 10^{-19} \text{ J}$	$1 \text{ Joule} = 6.25 \times 10^{18} \text{ eV}$	$h = 6.626 \times 10^{-34} \text{ J.s}$
$r_0 = 1.2 \times 10^{-15} \text{ m}$		$N_A=6.022 \times 10^{26} \text{ atoms/kg.mol}$
$1u = 1.660566 \times 10^{-27} \text{ kg}$	$1u = 931.5 \text{ MeV}$	
$m_e= M(^0e) = 0.000549 \text{ u}$	$m_p=1.007276 \text{ u}$	$M(^1_0n) = m_n=1.008665 \text{ u}$
$M(^1_1H) = m_H =1.007825 \text{ u}$	$M(^2_1H) = 2.014102 \text{ u}$	$M(^3_2He) = 3.016030 \text{ u}$
$M(^6_3Li)=6.015126 u$	$M(^{143}\text{Sm}) = 142.914460 \text{ u}$	$M(^{143}\text{Pm}) = 142.910800 \text{ u}$
$M(^{238}_{92}\text{U}) = 238.050760 \text{ u}$	$M(^{38}\text{K}) = 37.969090 \text{ u}$	$M(^{17}_8O)=16.999134 u$