

11(a)(i)	(nuclear) fusion
11(a)(ii)	$\Delta m = [0.030377 - (3 \times 0.002388)] \text{ u}$ (= 0.023213 u)
	$E = \Delta m c^2$
	$= 0.023213 \times 1.66 \times 10^{-27} \times (3.00 \times 10^8)^2 = 3.47 \times 10^{-12} \text{ J}$
11(b)(i)	mass of 1 mol of helium-4 = 4 g or mass of 1 helium atom = 4 u
	$N \text{ rate} = (6.02 \times 10^{23} \times 7.34 \times 10^{11}) / (4 \times 10^{-3})$ or
	$N \text{ rate} = (7.34 \times 10^{11}) / (4 \times 1.66 \times 10^{-27})$
	luminosity = $1.10 \times 10^{38} \times 3.47 \times 10^{-12}$ $= 3.83 \times 10^{26} \text{ W}$
11(b)(ii)	$L = 4\pi\sigma^2 T^4$
	$3.83 \times 10^{26} = 4\pi \times 5.67 \times 10^{-8} \times (6.96 \times 10^8)^2 \times T^4$
	$T = 5770 \text{ K}$