Question			Expected response	Max mark	Additional guidance
8.	(a)		(Nuclear) Fusion	**1**	
	(b)		Mass before $= 2 \times 3{\cdot}3436 \times 10^{-27}$ $= 6{\cdot}6872 \times 10^{-27}$ Mass after $= 5{\cdot}0082 \times 10^{-27} + 1{\cdot}6749 \times 10^{-27}$ $= 6{\cdot}6831 \times 10^{-27}$ Mass lost $= 4{\cdot}1 \times 10^{-30}$ (kg) **(1)** $E = mc^2$ **(1)** $E = 4{\cdot}1 \times 10^{-30} \times (3{\cdot}00 \times 10^{8})^2$ **(1)** $E = 3{\cdot}69 \times 10^{-13}$ J **(1)**	**4**	Accept: 3·7, 3·690, 3·6900 Check for correct substitutions of values in calculation of mass "lost". If values are incorrect, maximum **(1 mark)** for relationship. $E = mc^2$ anywhere **(1 mark)** If mass before and after not used to full 5 significant figures from table, then maximum **(1 mark)** for relationship. Ignore inappropriate reference to mass defect. Arithmetic mistake can be carried forward through the response. Truncation error in mass before and/or mass after- maximum **(1 mark)** for relationship.
	(c)		$\frac{4{\cdot}1 \times 10^{26}}{3{\cdot}69 \times 10^{-13}}$ **(1)** $= 1{\cdot}1 \times 10^{39}$ **(1)**	**2**	Or consistent with (b) Accept: 1, 1·11, 1·111