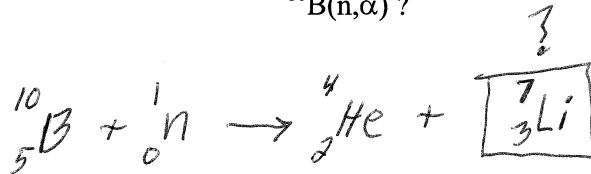


Prob. 1 For the following reaction, determine the unknown nucleus, and calculate the Q value:

$^{10}\text{B}(n,\alpha)?$



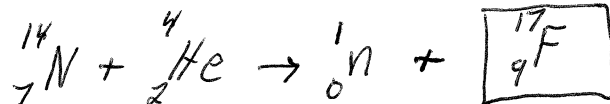
$$\frac{Q}{c^2} = M_{^{10}\text{B}} + m_n - M_{^4\text{He}} - M_{^7\text{Li}}$$

$$= 10.012937 + 1.008665 - 4.002603 - 7.016004 \quad \text{u}$$

$$Q = (0.002994)(931.5 \frac{\text{MeV}}{\text{u}}) = \boxed{2.79 \text{ MeV}}$$

Prob. 2 Complete each of the following by writing out the nuclear reaction in the usual form:

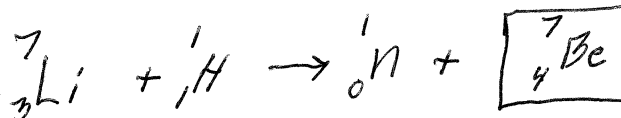
a) $^{14}\text{N}(\alpha,n)?$



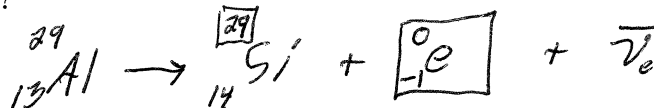
b) $^{31}\text{P}(\gamma,n)?$



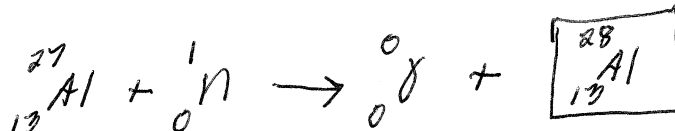
c) $^7\text{Li}(p,n)?$



d) $^{29}\text{Al} \rightarrow \text{Si} + ?$



e) $^{27}\text{Al}(n,\gamma)?$



f) $^{31}\text{P}(d,p)?$

