13. The binding energy is given by $\Delta E_{\text{be}} = [Zm_H + (A - Z)m_n - M_{\text{Pu}}]\, c^2$, where Z is the atomic number (number of protons), A is the mass number (number of nucleons), m_H is the mass of a hydrogen atom, m_n is the mass of a neutron, and M_{Pu} is the mass of a ${}^{239}_{94}\text{Pu}$ atom. In principle, nuclear masses should be used, but the mass of the Z electrons included in ZM_H is canceled by the mass of the Z electrons included in M_{Pu}, so the result is the same. First, we calculate the mass difference in atomic mass units: $\Delta m = (94)(1.00783\,\text{u}) + (239 - 94)(1.00867\,\text{u}) - (239.05216\,\text{u}) = 1.94101\,\text{u}$. Since $1\,\text{u}$ is equivalent to $931.5\,\text{MeV}$, $\Delta E_{\text{be}} = (1.94101\,\text{u})(931.5\,\text{MeV/u}) = 1808\,\text{MeV}$. Since there are 239 nucleons, the binding energy per nucleon is $\Delta E_{\text{ben}} = E/A = (1808\,\text{MeV})/239 = 7.56\,\text{MeV}$.