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Mass defect,BINDING energy per nucleon and its variation with mass number.

SUBJECT : PHYSICS
CHAPTER NUMBER: 13
CHAPTER NAME : NUCLEI

MASS DEFECT

If M = mass of the nucleus, then mass defect of the nucleus of an atom is

$$\Delta m = \left[Z m_p + (A - Z) m_N \right] - M$$

m_p = mass of protons $\qquad$ m_N = mass of the neutron

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BINDING ENERGY

Binding energy $E_b = \Delta mc^2$

Where Δm is the mass defect. E_b is the binding energy

And c= velocity of light

$$E_b = \left\{\left[ZM_P + (A-Z)M_N\right] - M\right\} \times C^2$$

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BINDING ENERGY CURVE

- DISCUSSON OF GRAPH RELATED TO NUCLEAR STABILITY.
- HOW B.E CURVES DECIDES NUCLEAR FUSION AND FISSION REACTION

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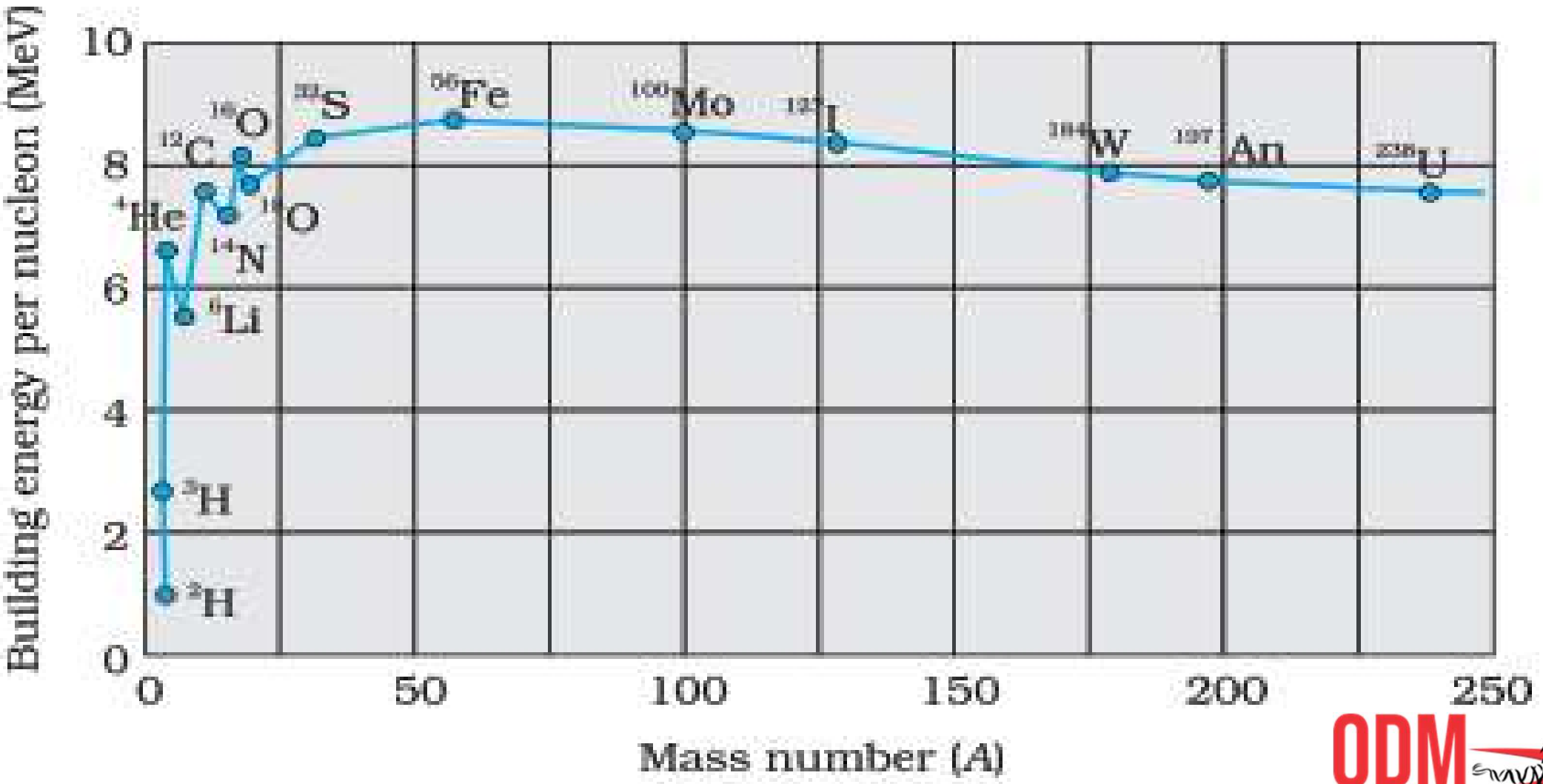

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NUMERICALS

What is the nuclear radius of ^{125}Fe, if that of ^{27}Al is 3.6 fermi.

:- Boron has two stable isotopes, $_5B^{10}$ and $_5B^{11}$. Their respective masses are 10.01294 am and 11.00931 am and the atomic weight of boron is 10.811 amu. Find the abundances of $_5B^{10}$ and $_5B^{11}$.

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NUMERICALS

:- Find mass defect of ${}_8O^{16}$ also find binding energy per nucleon of ${}_8O^{16}$ the nucleus. Given $M_P = 1.00727 \text{ and } M_N = 1.00866 \text{ amu}$ and mass of ${}_8O^{16} = 15.99053 \text{ amu}$.

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THANKING YOU

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