For odd A, this formula permits the calculation of the value of Z for which the energy is a minimum. For Z less than 50, and for neutron numbers greater than 82, the calculated curve is in good agreement with the position of, for instance, the nuclei of odd Z. Between Z = 50 and N = 82, however, the experimental values of Z seem to be below the theoretical curve. The disagreement can be explained by a definite shift of the stability line at 82 neutrons. This shift of the stability line can be explained by a change in binding energy of about 2 Mev. Also, according to the formula, equation 1, xenon^{136}, with 82 neutrons, should be unstable by about 2 Mev, whereas it is undoubtedly stable; Sm^{144} should be unstable against K-capture by .6 Mev, whereas Ba^{140}, with 84 neutrons, which is unstable, would be just stable according to formula.

Whereas these calculations are undoubtedly very uncertain, they may serve as an estimate of the order of magnitude of the discontinuity in the binding energies. Since the average neutron binding energy in this region of the periodic table is about 6 Mev, the discontinuities represent only a variation of the order of 30%. This situation is very different from that encountered at the closed shells of electrons in atoms where the ionization energy varies by several 100 per cent. Nevertheless, the effect of closed shells in the nuclei seems very pronounced.

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