

A. INTRODUCTION

The correlation between nuclear shell structure and β -decay characteristics had been noticed in early discussions on shell models.^{1),2)} It is already quite customary to refer to shell considerations in the discussion of decay schemes. The present paper, together with the immediately following companion paper³⁾ on even A nuclei, is intended to give a comprehensive review and interpretation of β -decay data based on all available information.⁴⁾

An excellent compilation of all nuclear data has recently been issued by the National Bureau of Standards.⁵⁾ Tabulations of f factors and ft values have been compiled by S. A. Moszkowski,⁶⁾ and by Feenberg and Trigg.⁷⁾

In the present paper we confine our attention to the ground states and isomeric states of nuclei. It is possible in many cases to interpret also known excited states. However, the uncertainties are here much greater, and the application of shell considerations are more uncertain.

The approach of this paper is essentially an empirical one. It would seem that there are a number of results of significance for the general theory of β -decay. However, the chief interest here is in a clarification of facts.

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- 1) L. W. Nordheim, Phys. Rev. 75, 1894 (1949)
 - 2) E. Feenberg and K. C. Hammack, Phys. Rev. 75, 1877 (1949)
 - 3) L. W. Nordheim, Rev. Mod. Phys., 24,000, (1952), quoted henceforth as II.
 - 4) The results of this work have already been summarized by L. W. Nordheim, Phys. Rev. 78, 294 (1950); the basic material has been presented by L. W. Nordheim, Tables for β -decay Systematics, informal distribution, 1950.
 - 5) NBS Circular 499: Nuclear Data, K. Way, L. Fano, M.R. Scott, & K. Thew, 1950.
 - 6) S. A. Moszkowski, A Summary of β -decay Theory, Chicago, Institute for Nuclear Studies, ONR Progress Report, 1949.
 - 7) E. Feenberg and G. Trigg, Tables of Comparative Halflives of Radioactive Transitions, O.N.R. and A.E.C. report, 1949, also Rev. Mod. Phys. 22, 399 (1950).