

difficulté. Pour pouvoir tracer cette courbe, il suffit simplement de pouvoir disposer d'une source de Ra + Be et d'un compteur Geiger-Müller. Cette méthode de dosage est caractérisée par sa grande simplicité et de ce fait elle présente un avantage sérieux sur la méthode classique du dosage chimique du bore¹.

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Summary

It is well known that slow neutrons are strongly absorbed by some elements, while the absorption of these neutrons is very small for many other elements. Boron is the only element present in pyrex glass having a high cross-section. Using dysprosium detectors, a standard curve can be obtained indicating the activity measured for different concentrations of boron in the powdered pyrex. Working always under the same geometrical conditions, unknown concentrations of boron in pyrex can be easily determined.

¹ Ce travail a été exécuté au Laboratoire de Chimie Nucléaire que dirige M. le Prof. JOLIOR (Collège de France) et je tiens à exprimer ici toute ma gratitude pour l'accueil si aimable qu'il m'a réservé. J'exprime aussi toute ma reconnaissance à M. P. SOR qui a proposé ce travail et qui n'a cessé de me seconder au cours de sa réalisation.

New Demonstrations of the Medium-Size Ring Effect

The catalytic oxidation of homologous tricyclic indole derivatives¹ furnishes peroxides² the structure and stability of which show a marked dependence on the size of the isocyclic ring C. The most stable peroxide is 11-hydroperoxytetrahydrocarbazolenine (III, $n = 6$).

¹ B. WITKOP, J. Amer. Chem. Soc. 72, 1428 (1950). – B. WITKOP and J. B. PATRICK, Exper. 6, 183 (1950).

² Cf. R. J. S. BEER, L. McGRATH, A. ROBERTSON, and A. B. WOODIER, Nature 164, 362 (1949).

In solution it shows an acid-catalyzed rearrangement¹ leading to the cyclic lactam (VII, $m = 9$). The spectrum of this lactam would suggest considerable steric inhibition of resonance between the aromatic ring and the various functional groups. The base-catalyzed internal condensation of the 9-membered lactam (Camps reaction) leads to the linear tricyclic quinindene derivative (VIII), which was identified with a specimen synthesized according to PLANT *et al.*². When a solution of tetrahydrocycloheptindole (II, $n = 7$) was oxidized catalytically and the crude solution was filtered through a column of aluminum oxide, compound IX was isolated. The basicity of the aluminum oxide was sufficient to catalyze internal condensation of the intermediate lactam (VII, $m = 10$) to an angular tricycle. Thus, a striking difference becomes apparent between lactams of the critical ring size, and one is tempted to believe that in these borderline cases the so-called "medium-size ring effect"³ determines the course of the internal condensation in either the angular or linear direction. The reactions of dihydrocyclopentindole⁴ and hexahydrocyclooctindole are summarized in the table.

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Zusammenfassung

Die katalytische Oxydation homologer trizyklischer Indol-Derivate führt über die Zwischenstufe von Peroxyden zu Umlagerungs- und Kondensationsprodukten, deren Konstitution von der Größe des isozyklischen Ringes abhängt. Bemerkenswerte Unterschiede treten in der Nähe der kritischen Ringgröße ($n = 8-10$) auf.

¹ Cf. R. CRIGGEE, Ann. chem. 560, 127 (1948).

² B. K. BLOUNT, W. H. PERKIN, and S. G. P. PLANT, J. Chem. Soc. 1975 (1929).

³ V. PRELOG, J. Chem. Soc. 420 (1950).

⁴ W. H. PERKIN and S. G. P. PLANT, J. Chem. Soc. 123, 3242 (1923).

