

[Spectrochim. Acta, 49A,1131-1137 (1993)]

[Lab. of Instrumental Center]

**Vibrational spectra of  $\beta$ -lactams—III. Potassium 2-azetidinone-1-sulfonate and its isotopic compounds.**

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The IR and Raman spectra of potassium 2-azetidinone-1-sulfonate and its three deuterated and two  $^{15}\text{N}$ -substituted compounds have been recorded, and the observed bands have been assigned on the basis of the isotope effects and the normal coordinate analysis. Comparison of the force constants for the amide group among 2-azetidinone, 1-methyl-2-azetidinone and potassium 2-azetidinone-1-sulfonate indicates that there is a correlation between these constants and the ease of hydrolysis which was determined by NMR spectroscopy, depending on the amide resonance.

[Chem. Pharm. Bull., 41, 842-845 (1993)]

[Lab. of Inst. of Manufacturing Pharmacy]

**Reactions of 9-Phenylthioxanthene 10-Oxide with Organometallic Reagents.**

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Reactions of a cyclic sulfoxide bearing an active hydrogen atom at the  $\gamma$ -position, 9-phenylthioxanthene 10-oxide with a variety of Grignard reagents afforded 9-substituted 9-phenylthioxanthenes. Similarly, organolithiums reacted with the sulfoxide to give the corresponding 9-substituted 9-phenylthioxanthenes. The structures of 9-aryl group substituted 9-phenylthioxanthenes were confirmed by the alternative synthesis of the samples *via* the acid-catalyzed cyclization of triarylmethanol derivatives. A possible mechanism by way of a 9-phenylthioxanthylum ion intermediate is proposed for the reaction of the sulfoxide with organometallic reagents.

[Jpn. J. Hyg., 47, 1021-1031 (1993)]

[Lab. of Health and Physical Education]

**Effects of Exercise in the Growing Stage in Mice and of *Astragalus Membranaceus* on Immune Functions.**

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A study was carried out to examine the effects of exercise in the growing stage in male ICR mice and of *Astragalus membranaceus* (As) on their immune functions. The exercise received was forced running at 15m/min on a flat floor without any slope for 60min a day. As extract was given p.o. at 200mg/kg per day. The duration of running exercise and administration of As were 5 days per week for 12 weeks. As a results, the forced running exercise in the growing stage in mice and the administration of As enhanced immune functions and that they might also intensify the functioning of the host defense system.