

Cesium: A Bibliography Update

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MESSIHA, F S *Cesium A bibliography update* PHARMACOL BIOCHEM BEHAV 21: Suppl 1, 113-129, 1984.—A brief outline of both industrial and medicinal uses is given This is followed by a survey of literature on cesium salts for the period between January 1981 to May 1984. The bibliography searched indicates an interesting pharmacological and behavioral effect for Cs-salts in addition to its well known physiological and itopic effects A pattern of clinical trials suggests the potential of cesium salts in certain cancer therapies, affective disorders, tumor imaging, radiotherapy and certain cardiovascular usages The need for continued probing into the biological activity of this alkalimetal is suggested.

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CESIUM (Cs) salts have various industrial and analytical applications, e.g., in the manufacture of semiconductors, certain selective electrodes, thermionic converters, in photoelectric cells, and in vacuum tubes. The chloride and sulfate salts of Cs are used in density gradient centrifugation for separation and purification of various biological materials derived from man and from laboratory animals while cesium iodide shows good results for visible and infrared spectral region usages. The frequency of the Cs atom vibration found its use in the production of one type of atomic clock.

Renewed interest in Cs occurred subsequent to the recognition of its presence in nuclear fallout, the resulting environmental contaminations and the implicated hazard conditions which extend to both animals and man. The natural isotope is ^{133}Cs . However, a series of artificial radioactive Cs, i.e., Cs-11, 12, 123, 125-132, 134-144, have been made available for various usages. The ^{137}Cs has been often used in various studies and its physical $T_{1/2}$ of 65 to 84 days in man. The use of radioactive Cs compounds contributed to the elucidation of various biological and physiological aspects of Cs. For example, Cs is absorbed after oral intake, circulates in blood and is bound to cells of soft tissues, with highest localization found in skeletal muscles with particular preference for the red muscle. This suggests that Cs-mediated responses will be related to neuromuscular function and this may persist for a prolonged period of time due to the relative $T_{1/2}$ span of Cs.

The medicinal application of Cs appeared during the 1970's and continues to grow to present. For example, Cs

isotopes have been in use in radiotherapy, i.e., application of ^{129}Cs as a tumor imaging agent to malignant and benign pulmonary lesions, and ^{137}Cs has been utilized in uterine cervix cancer by the Amersham manual afterloading procedure. Moreover, ^{137}Cs has been substituted for conventional Iridium-192 in interstitial thermoradiotherapy while ^{130}Cs has been tried for myocardial imaging. Another cardiovascular use of Cs may be related to evaluation of sino-atrial node pace-making and to the electrophysiological properties of the myocardial cells. In the present proceedings, it has been shown that Cs salts possess the potential as chemotherapeutic agents in certain cancers and experimental data from this laboratory has consistently demonstrated a CNS-stimulating property for Cs-salts analogous to that reported for Rb salts, suggesting its use as antidepressants. Another future therapeutic application for Cs-salts is based on animal experiments reported from this laboratory and confirmed by another group of investigators suggesting the potential of CsCl in modulation of antipsychotic medication-induced extrapyramidal motor dysfunction.

These foregoing observations are indicative of a promising future clinical application for Cs-salts and/or isotopes in various medical conditions. This warranted the present update of Cs bibliography from 1981 to May, 1984. The number of references cited in each article is given in parentheses. Basic knowledge on the various properties of this interesting alkalimetal ion may provide a useful tool for planning future clinical strategies

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