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Preparation Thin Film Sources of Radiolanthanides for the Measurement of Auger Electron Energies and Branching Ratios

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With recent advances in the use of novel radiolanthanides for targeted Auger electron therapy, the request for precise and controlled dosimetry has increased in importance. So far, no experimental data for the energy and branching ratios of Auger electrons have been reported for Auger-electron-emitting lanthanides. One of the main challenges related to such measurements is the production of a uniform thin film in order to avoid energy loss of the emitted Auger electrons through self-absorption. Ho-161 is considered a promising radiolanthanide for internal radiotherapy, thanks to its appropriate half-life (2.48 hours) and its chemistry being very similar to the one of other well-consolidated therapeutic lanthanides. In this study, holmium is deposited as a thin film via molecular plating. In particular, the effect of the solvent's vapor pressure on the deposition morphology is thoroughly investigated by means of autoradiography and scanning electron microscopy coupled with energy dispersive X-ray spectroscopy.

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