"Bifunctional Chelating Agent for 225Ac" (1) and "Synthesis of a novel bifunctional chelating agent for 225Ac complexation" (2)

The inventions describe three bifunctional chelating agents for metals and especially for actinides and lanthanides, and even more specifically for 225Ac. Three bifunctional vectors — macrocycle ligands of the type polyaza polycarboxilic or polyphosphonic — their method of synthesis, and their uses are disclosed in the inventions.

These ligands are useful for radiolabelling proteins with radioactive metals and are used in radioimmunoimaging and/or radioimmunotherapy. The ligands firmly link actinium to proteins, minimise metal release, and permit a highly selective delivery of particles to targeted sites in vivo, avoiding thereby collateral damages to non-tumorous cells. The utilisation of 225Ac allows efficient destruction of tumour cells while sparing normal cells (short range of α-particles (<100μm) and high energy transfer).

Besides immunotherapy applications, the ligands can also be used to bind 225Ac to any biological or non-biological structure for different kind of applications. They can also be used alone to serve as detoxification agents or grafted on a chromatographic column to purify or concentrate any solution containing 225Ac. Finally the ligands can also be used in the process of separation of minor actinides or lanthanides in nuclear waste or to separate specific groups of metals in high level waste.

Application areas

- Radioimmunotherapy
- Radioimmunoimaging
- Detoxification agents
- Chromatography
- Extraction techniques

Innovative aspects and main advantages

- High affinity for Actinide and Lanthanide, 225Ac in particular.
- Possibility to use the ligand for other applications

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2675

**IPR status:**
Patent granted

**URL:**

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- Nuclear safety and security [3]
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- health [7]
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