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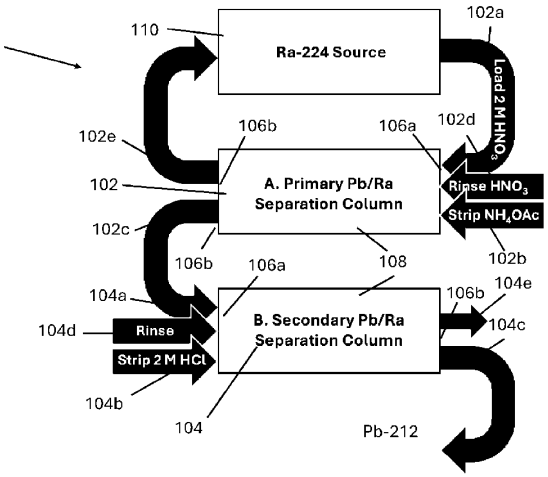
(54) Title: SYSTEMS AND METHODS FOR GENERATING LEAD

Fig. 1



(57) Abstract: A method for separating a lead radioisotope from a mixture comprising the lead radioisotope and a radioisotope of radium or thorium is provided, along with a system comprising a plurality of chromatographic columns. The system can include a first cartridge having a lead-complexing media that preferentially binds the lead radioisotope over radioisotopes of radium or thorium, and a second cartridge having a weak cationic exchange media, where a pH of a loading solution used to load the second cartridge is pH^{2L}, and a pH of an eluent used to elute the lead radioisotope from the second cartridge is pH^{2E}, and pH^{2L} is greater than pH^{2E}. The system can also comprise further third and fourth cartridges with chromatographic media to extract and purify the lead radioisotope, to provide a purified solution of lead radioisotope that can be used for medical and other purposes, such as in the labeling of radiopharmaceutical compounds.

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