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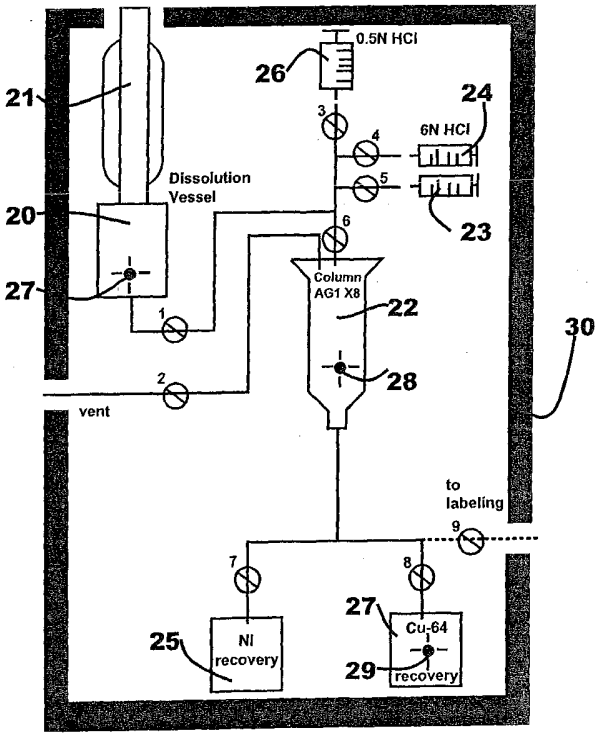
[Continued on next page]

(54) Title: AUTOMATED SEPARATION, PURIFICATION AND LABELING SYSTEMS FOR ^{60}CU, ^{61}Cu and ^{64}Cu RADIONUCLIDES AND RECOVERY THEREOF

Copper Separation & Purification Unit Schematic



(57) Abstract: A novel method for separating an irradiated ^{60}CU or ^{61}CU or ^{64}CU respectively from a composition containing ^{60}Ni or ^{61}Ni or ^{64}Ni respectively therein comprises dissolving the irradiated ^{60}CU or ^{61}CU or ^{64}CU in a solvent acid to form an acidic solubilized composition, feeding the acidic solubilized composition onto an ion exchange column and removing an eluent comprising ^{60}Ni or ^{61}Ni or ^{64}Ni ions. In an aspect the eluent is further processed for ^{60}Ni or ^{61}Ni or ^{64}Ni recovery and recycling to prepare future targets. In an aspect ^{60}CU or ^{61}CU or ^{64}CU respectively is temporarily trapped into the ion exchange column resin and held for subsequent recovery by addition of 0.5 N HCl to elute out the ^{60}CU or ^{61}CU or ^{64}CU for further use or labeling. An enhanced process for labeling compounds with highly ^{60}CU or ^{61}CU or ^{64}CU comprises loading ^{60}CU, ^{61}CU and ^{64}CU elute onto a concentrating cartridge, collecting the 0.5N HCl eluent and admixing therewith 10-μL of ligand and 3N HCl solution in a reaction line to form a $^{60 \text{ or } 61 \text{ or } 64}$CU labeled product. In an aspect a further purification step comprises loading 10-mL sterile water into the reaction line and through the C_{18} Sep-Pak cartridge to further purify the labeled product which is adherent in the cartridge and ^{60}CU, ^{61}CU and ^{64}CU each as a separate and independent purified product.

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,693,324 A (EDWARDS) 02 DECEMBER 1997.	1-38
A	US 5,420,321 A (EDWARDS) 30 MAY 1995.	1-38
A	US 5,409,677 A (ZINN) 25 APRIL 1995.	1-38

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