

## Eichrom's Nickel 63/59 Method

EiChrom Industries provides a total solutions package for solving radiochemical separations problems.

ORTEC has organized a number of the procedures developed by EiChrom (and its collaborating partners) for convenient access to our Customers, Sales Team, and Technical Support Specialists. For questions about radiochemical separations and alpha-spectrometry please contact:

Michael Schultz, Application Specialist, ORTEC, 801 S. Illinois Avenue, Oak Ridge, TN, 37830-0895, Phone: (865) 481-2446, Fax: (865) 483-0396, Email: michael.schultz@ortec-online.com

Nickel Resin directions for use

1. To an appropriate aliquot of sample, add 2 mg of nickel carrier.
2. If the presence of  $\text{Fe}^{55}$  must be taken into account, it should be removed prior to the separation of Ni isotopes. See the attached procedure as an example of such a method if analysis of  $\text{Fe}^{55}$  is desired. The 8 M  $\text{HNO}_3$  load and wash solutions of this procedure would contain the nickel isotopes. Actinide elements will also remain on the column with the  $\text{Fe}^{55}$ . Alternatively, if negligible quantities of  $\text{Fe}^{55}$ /actinides are expected to be present, an iron/nickel hydroxide precipitate (@pH 7-8) can be performed to concentrate the sample.
3. If the nickel fraction is as a nitrate, evaporate to NEAR dryness and convert to chloride form with concentrated HCl. Then dissolve in approximately 5 mL of 1 M HCl. If the nickel fraction is as an iron/nickel hydroxide precipitate, dissolve ppt. in approximately 5 mL of 1 M HCl. Alternatively, add 4-6 drops or the minimum amount needed of 6 N HCl with swirling to dissolve the iron/nickel hydroxide precipitate. Then dilute the sample with 5 mL DI water.
4. Add 1 mL of 1 M ammonium citrate to the sample and adjust to pH 8-9 with ammonium hydroxide.

*Note: It is recommended to use a pH meter. The pH is critical and pH paper is not sufficiently accurate.*
5. Place a Nickel Column in a column rack. Rinse the column with 5 mL of 0.2 M ammonium citrate that has been adjusted to pH 8-9 with ammonium hydroxide.
6. Load sample onto the Nickel Column. A red band will appear on the column. Discard the effluent.

7. Rinse the column with 20 mL of 0.2 M ammonium citrate that has been adjusted to pH 8-9 with ammonium hydroxide. Discard the effluent.

8. Strip nickel from the column with the minimum amount of 3 M HNO<sub>3</sub> (added in 5 mL increments) required to completely dissolve and elute the red band from the column.

*Note: The column has been destroyed at this point.*

9. A portion of the 3 M HNO<sub>3</sub> solution can be used for yield determination via ICP. The remainder can be used for counting by existing laboratory methods. Ni<sup>63</sup> can be measured by LSC; Ni<sup>59</sup> by X-Ray.

*Note: The nickel/dimethylglyoxime complex is difficult to destroy. It is not recommended that the strip solution be taken to dryness as an insoluble black residue will result.*

Aug 27, 1996