Media Sorption Study in Column Format

1. Prepare Media for sorption study
   1. Weighed out 10 g of Media 1(-50 +100) it in a clean 500mL beaker
   2. Added 250mL of DI water
   3. Equilibrate with stirring for about 45 minutes
   4. Measure pH
   5. Add 0.5mL of 1M NaOH
   6. Equilibrate with stirring for about 30 minutes
   7. Measure pH
   8. Repeat steps 7-9 until pH is 5.0-5.5 at conclusion of the 30 minutes stirring period
   9. Wet pack the glass column with the pH adjusted media
2. Sorption of REE on media
   1. Pump Brine 1M through the column at 2 ml/min
   2. Collect the effluent in 50 ml fractions
   3. Measure pH
   4. Continue to pump brine until the collected effluent fraction reaches a pH of 5.5 (expect 100 hours or so)
   5. Prepare 14ppm REE7 doped Brine 1M and pump 100 ml through the column at 2 ml/min.
   6. Collect 10 ml fractions
   7. Measure pH
3. Strip
   1. Analyze each fraction for REE content
   2. Pump 1 l of Brine 1M through the column at 2 ml/min until collecting 50 ml fractions
   3. Measure pH and REE content of each fraction
   4. Pump 100mL of 2M HNO3 through the column, collecting 10 ml fractions
   5. Measure pH and REE content of each fraction
4. Regeneration
   1. Adjust 10 l of Brine 1M to pH 6.5 at 2 ml/min
   2. Pump the pH adjusted brine through the column
   3. Collect the effluent in 50 ml fractions.
   4. Measure the pH every 100 ml collected
   5. Once the pH reaches 5.5 the column has been regenerated and is ready to reuse

This experiment was performed twice on one load of media. The following table shows the REE sorption load and the amount of REE stripped from the column for both experiments.