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Soluble Ions & the Extraction Process – It's All About Timing

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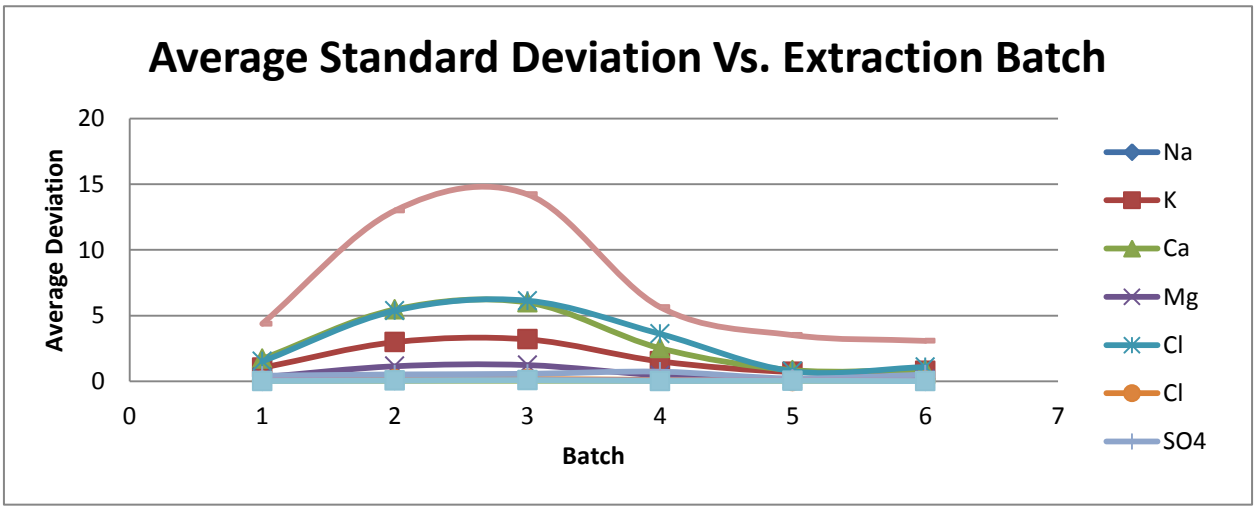
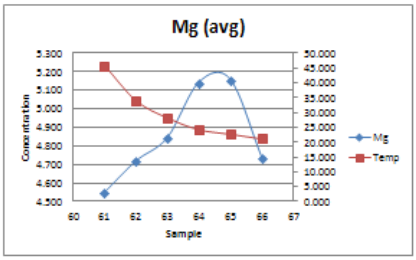
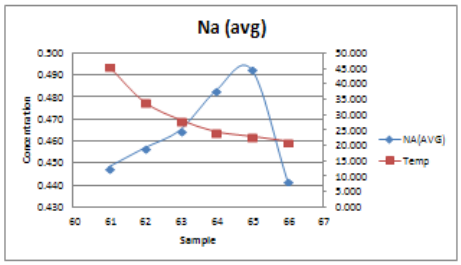
Summary

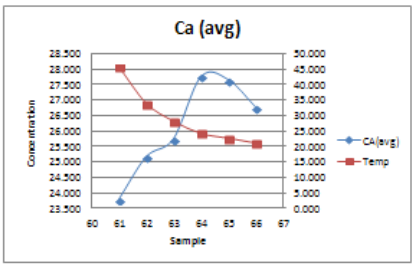
The extraction of bitumen from surface-mined oil sands in Alberta, Canada is a water-based process that involves making an ore-water slurry and then recovering the bitumen product as a froth. The mineralogy of the ore, in particular the clay content can have a large impact on extractability. In a laboratory setting, the oil sands samples are mixed with hot water and then the extract is used to determine the soluble ion concentrations through the use of IC & ICP instrumentation. The concentration levels of the ions can then be used to help modify the mining process. This study evaluates the extraction time in a laboratory setting and various intervals to understand the variability and repeatability of the ion concentrations. As a result, the majority of the ion levels increase and plateau after a period of time, and subsequently decrease after extended longer periods of 16 hours. Moreover, the deviation in ion concentration for a given sample batch decreased as time increased, showing improved statistical variations. As a result, further studies are suggested to evaluate if the same phenomenon will occur given different variations of ore type.

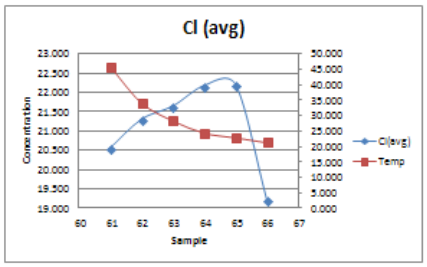
Examples

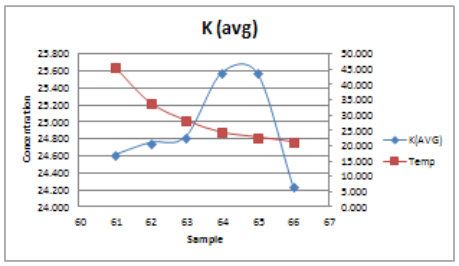


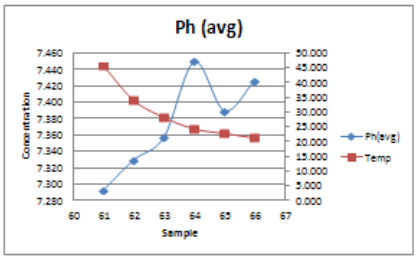

Mg (avg)
Concentration
Sample
Mg
Temp

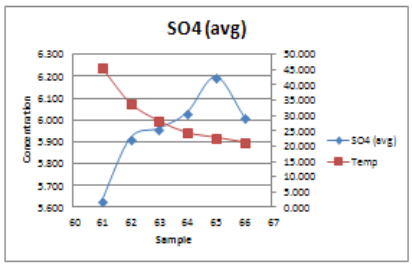

Na (avg)
Concentration
Sample
NA(AVG)
Temp

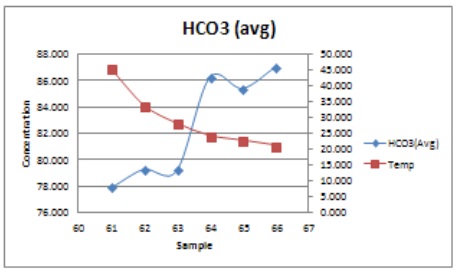

Ca (avg)
Concentration
Sample
CA(avg)
Temp

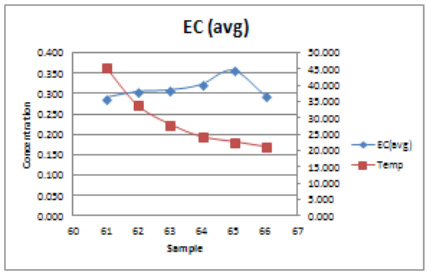

Cl (avg)
Concentration
Sample
Cl(avg)
Temp


K (avg)
Concentration
Sample
K(AVG)
Temp


Ph (avg)
Concentration
Sample
Ph(avg)
Temp


SO4 (avg)
Concentration
Sample
SO4 (avg)
Temp


HCO3 (avg)
Concentration
Sample
HCO3(Avg)
Temp


EC (avg)
Concentration
Sample
EC(avg)
Temp