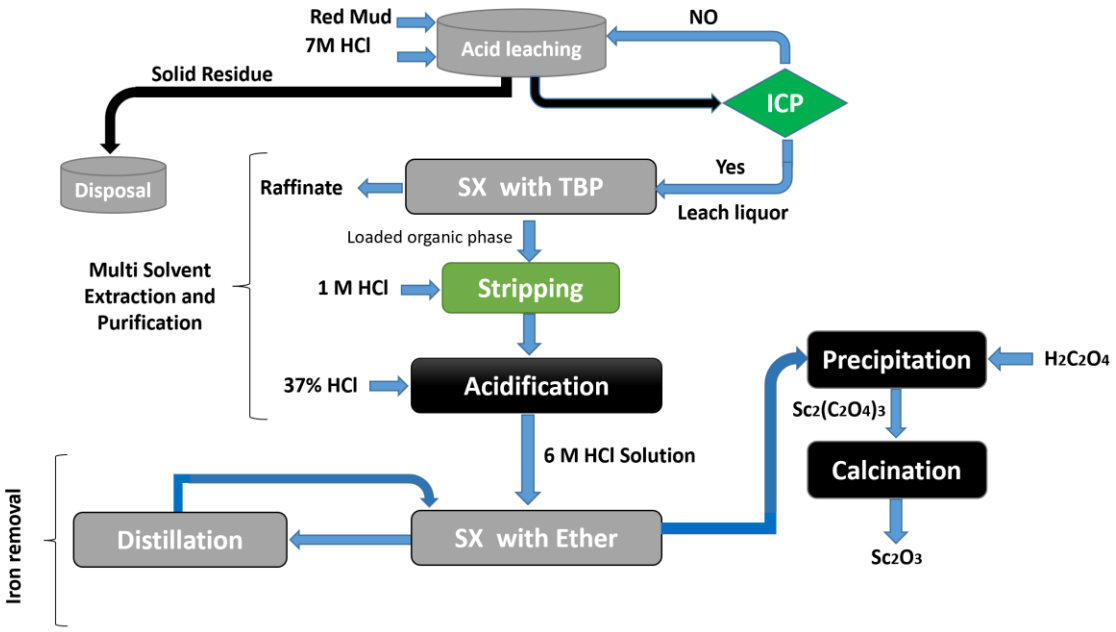
**Prof. Dr. habil. Hosam Eldin Bayoumi**

**Questions:**

**Q1**. Is it possible to recover **Sc** element from Hungarian bauxite residue at industrial scale?

**A1**. Yes, there is a big opportunity to recover **Sc** element selectively by liquid-liquid extraction based on the following process flow diagram:

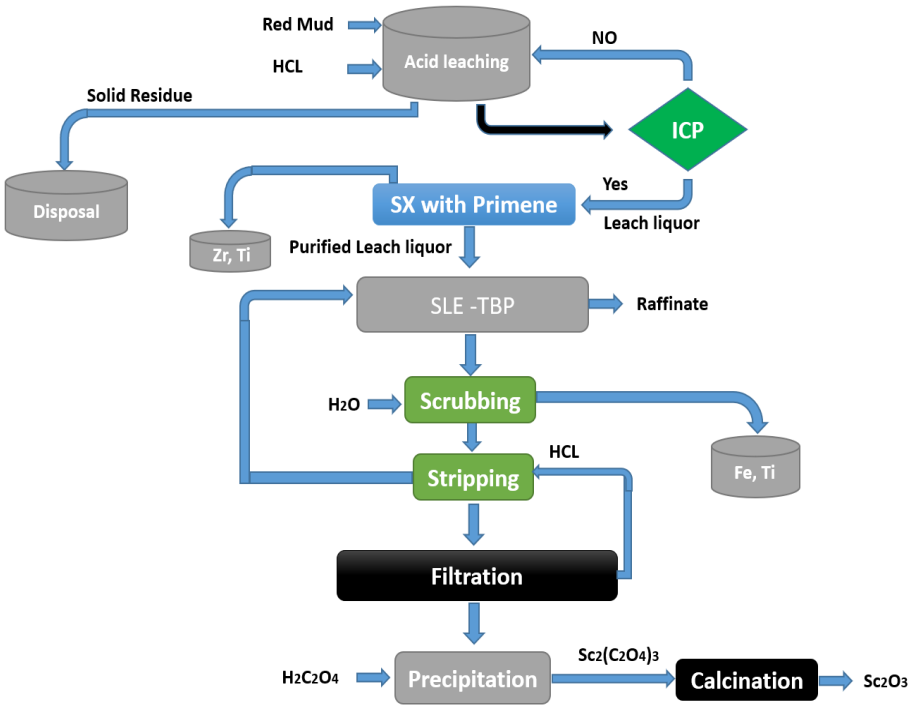



**Q2.** Can you suggest some other economical elements to recover them from Hungarian bauxite residue?

**A2** Hungarian bauxite residue as a resource opens up various possibilities for the extraction of minerals and ions such **as** the major elements **Fe, Ti, Mn, Al, Ca, Na.** Moreover, rare earth elements such as **Ce, La, Y, Nd, Sm** are also valuable elements present inside bauxite residue.

**Q3.** As chemical engineer/ researcher, can you design/ suggest full process flow diagram for the recovery of **Sc** from Hungarian bauxite residue based on Solid-Liquid Extraction technology?

**A3**. Yes, I suggest the following process flow diagram:




**Q4**. You touched on a very important concept it's the selectivity and chelation of different compounds, explain what the difference between them?

**A4**. Chelation is the formation of multiple coordination bonds between organic molecules and a metal ion leading to sequestration of the metal. Selectivity is the ability to determine the metal ion of interest in preference to other metal ions (potential interferences). There are also an important factors which play an important role in the selectivity and chelation process, such as the dimensions of the molecules, the diameter of the metal ions, donor ligands types and the pH of solution.

**Q5**. Based on your experience, is it possible to apply one of the suggested methods on an industrial scale.

**A5.** Yes, among the studied methods /protocols, I recommend the protocol **C** of *triple liquid-liquid extraction* for the efficient recovery of  scandium from the red mud leachate at industrial scale.

Ali Dawood Salman
17.05.2023