

HYDRODYNAMIC CHARACTERIZATION AND SCALE-UP OF BATCH CRYSTALLIZER FOR BATTERY MATERIALS RECOVERY

M. Ćosić*, A. Čelan, T. Đolonga, T. Smoljan

University of Split, Faculty of Chemistry and Technology, Ruđera Boškovića 35, Split

*marija.cosic@ktf-split.hr

Hydrometallurgy for LiB recovery



Black mass

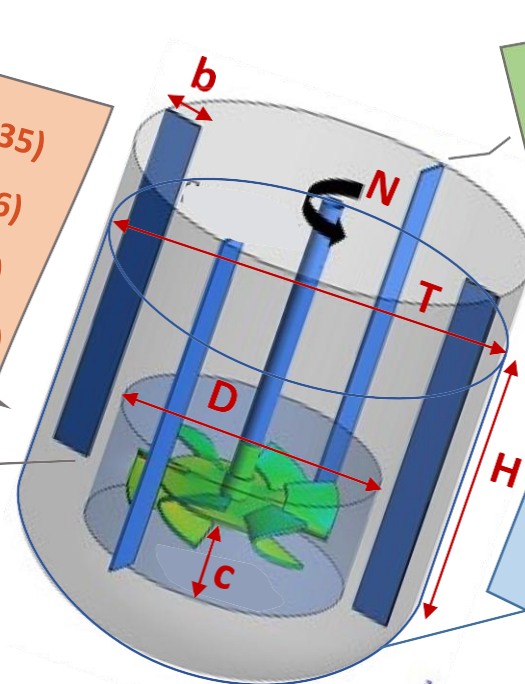
Leaching

Precipitation



$H = T = \text{const. (1-1.35)}$
 $D/T = \text{const. (0.3-0.6)}$
 $c/H = \text{const. (0.3-0.7)}$
 $b/T = \text{const. (0.10-0.14)}$

constant:
fluid velocities
profiles



$$Re = \frac{ND^2\rho}{\mu} \geq 12\,500$$

$$(\pi ND)_{LAB} = (\pi ND)_{IND}$$

$$\frac{Re}{Fr} \geq 1.25$$

SCALE-UP ACHIEVEMENTS:

- agglomeration and breakage control
- predictable CSD and morphology
- supersaturation homogeneity
- uniform cooling rate

Semi-batch lab-scale crystallizer

LAB

SCALE-UP

INDUSTRY

GEOMETRICAL SIMILARITY

DYNAMIC SIMILARITY

KINETIC SIMILARITY

