

## RESULTS

**TURBISCAN On line** measures a transmission increase as a function of time, which corresponds to the clarification of the system (dissolution). On *Figure 1*, we can compare the solubility of sodium, potassium and calcium carbonate in water.

It allows to draw the  $\lambda$  measurements as a function of time (*Figure 2*): the mean path length of photons in the dispersion is increasing (characteristic of particle size decrease: *Figure 4*).

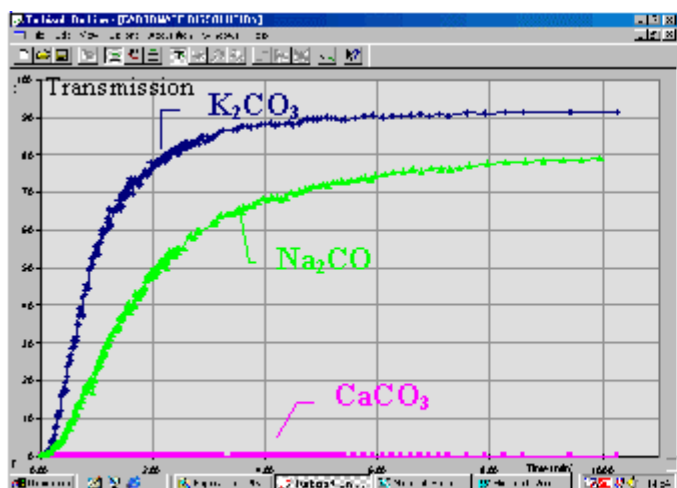


Figure 1

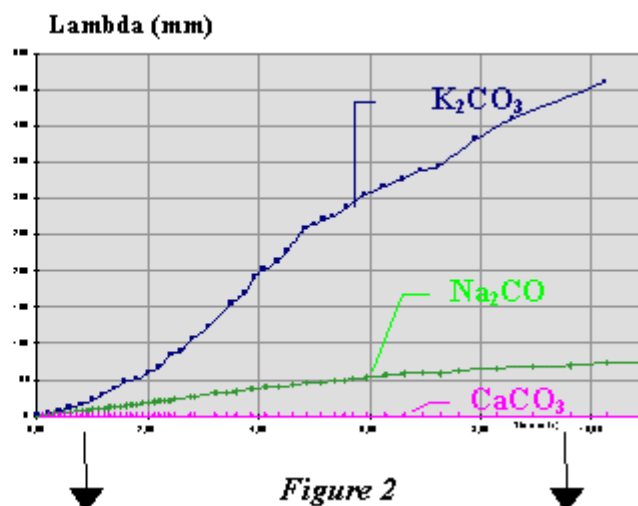


Figure 2

Carbonate	Initial speed of dissolution through transmission (% / min)	Initial speed of dissolution through $\lambda$ (mm/min)
CaCO <sub>3</sub>	0	0
Na <sub>2</sub> CO <sub>3</sub>	24	7.66
K <sub>2</sub> CO <sub>3</sub>	54	21.15

Figure 3

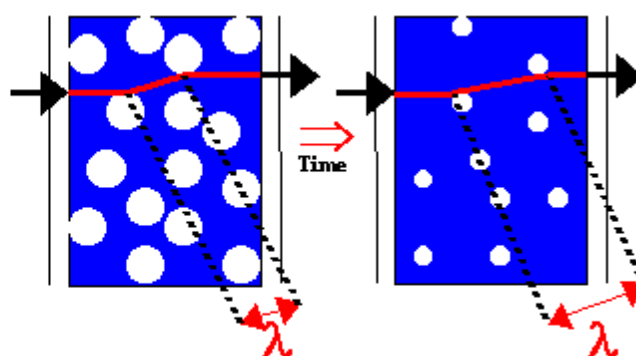


Figure 4

The calculation of these kinetics slopes (on 1 minute) enables to determine the initial speeds of dissolution (transmission variations or mean path length of photons as a function of time: *Figure 3*).

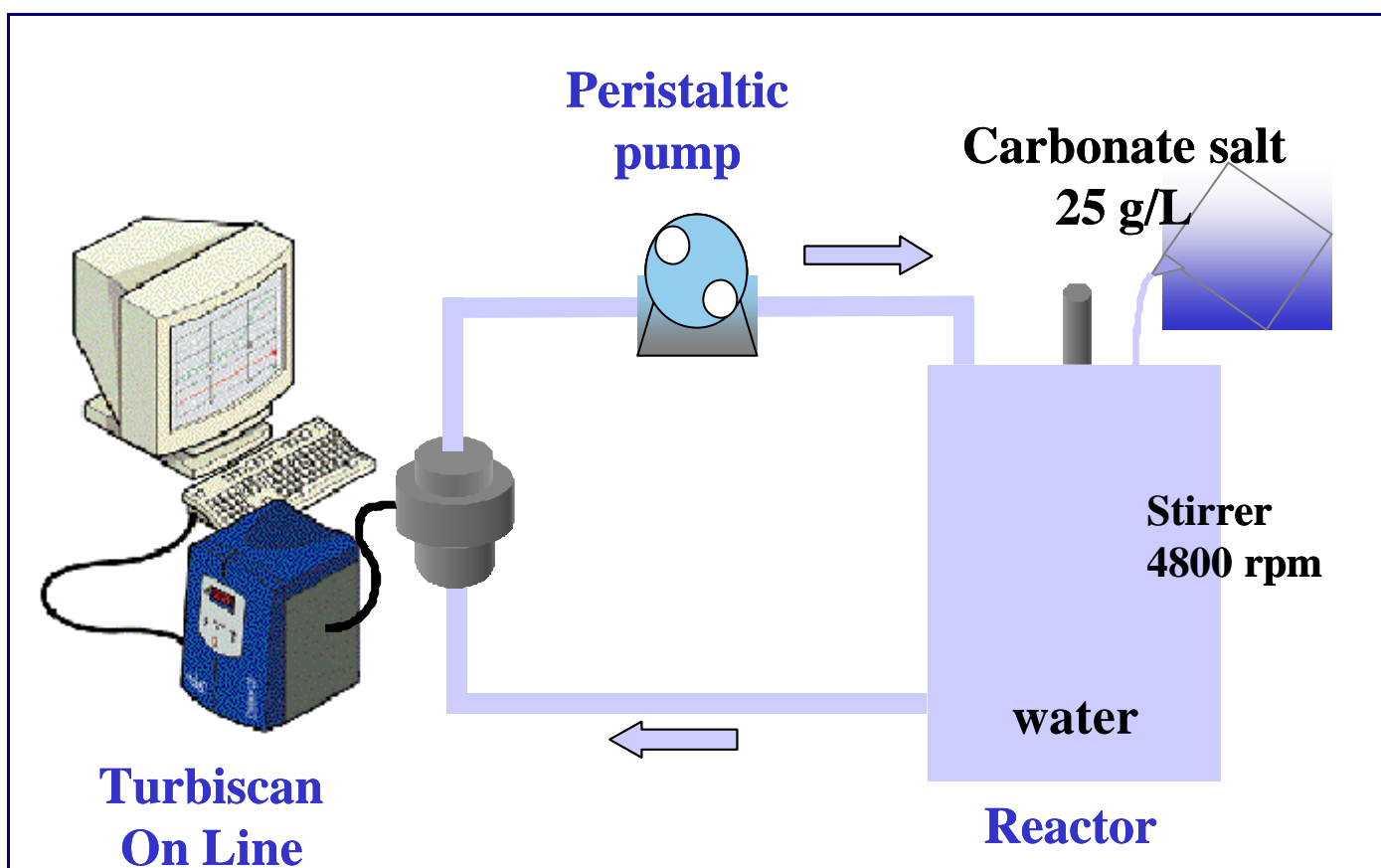
We can quantitatively compare the initial speeds of dissolution of these carbonate salts in water. The conclusion is that carbonate is more soluble when associated with potassium ions then associated with sodium ions, while it is insoluble when associated with calcium ions.

## CONCLUSION

The **TURBISCAN On line** follows dissolution process in real time, with an high acquisition frequency (0.1 s). It allows to monitor and quantify the effect of process variables on your dispersed system.

### Effect of the Positive Ion nature On the Carbonate Dissolution Efficiency

#### EXPERIMENTAL SET UP



We analyse the efficiency of carbonate dissolution in water as a function of the nature of the positive ion (potassium  $K^+$ , sodium  $Na^+$ , calcium  $Ca^{2+}$ ) associated with the carbonate.

The concentration for each of them is 25 g/l.

Three experiments were made by introducing the carbonate salt powder in water and by stirring the product with a dissolver disk at 4800 rpm.

The time  $T_0$  corresponds to the moment when we introduced the carbonate powder in the reactor.

The *TURBISCAN On line* monitors the evolution of the transmission light intensity in real time, it is displayed on the indicator and can be analysed (zoom, treatments ...) with the software.