

## Effect of NaCl Precipitation on Vapour-Liquid Dechlorination of Fluorocarbons

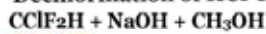
Hideo Nishiumi and Ryo Kato

Chem. Eng. Lab., Hosei University, Tokyo JAPAN

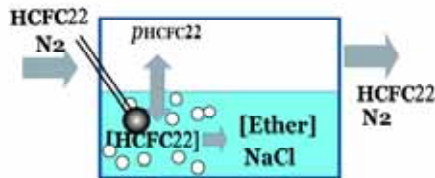
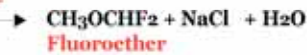
### INTRODUCTION

Since fluorocarbons containing chlorine atoms (CFCs, HCFCs) deplete the ozone layer, the production has been banned. However, if one can convert these chlorinated wastes into useful compounds, they can be regarded to be valuable chemical feed stocks.

### Dechlorination of HCFC22



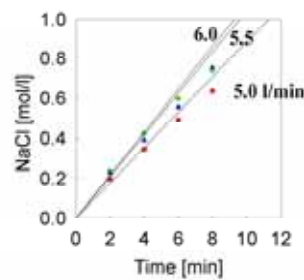
**HCFC22**



before

in a few minutes NaCl precipitated

### Initial Reaction Rate

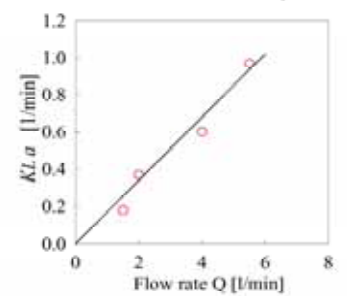


**Effect of Flow Rate**  
 → Reaction rate is rate determining step.

$$dC_{\text{NaCl}}/dt = k(p_{\text{HCFC22}}/H)C_{\text{NaOH}} \quad (3)$$

It worked well at the initial reaction. However, the rate decreased as reaction proceeded.  
 NaCl precipitation may have disturbed mass transfer of HCFC22.

### Mass Transfer Reduction by NaCl



$$KLa = 0.170 Q \exp(-m C_{\text{NaCl}}) \quad (7)$$

Fitted optimum value of  $m$  was found to be 3.

$$dC_{\text{HCFC22}}/dt = KLa(C_{\text{HCFC22}} - C_{\text{HCFC22}}^*) - k C_{\text{HCFC22}} C_{\text{NaOH}} \quad (8)$$

$$dC_{\text{NaCl}}/dt = k C_{\text{HCFC22}} C_{\text{NaOH}} \quad (9)$$

