

## RECENT RESULTS IN ELECTROCHEMICAL FLUORINATION

Peter Sartori\* and Enno Hollitzer

Universität Duisburg, Lotharstr. 1, D 4100 Duisburg 1 (F.R.G.)

The term 'electrochemical fluorination' is used for different methods of electrolysis in fluorine donor solvents. For better identification we propose to differentiate as follows

Method	Electrolyte	Anode	Potential
Electro-chemical Perfluorination (Simons Process)	Anhydrous HF (NaF, KF, LiF)	Ni	5-7 V
Molten salt electro-fluorination	$\text{NH}_4\text{F} \cdot \text{HF}$ or $\text{KF} \cdot 2 \text{ HF}$ ; $T > 100^\circ\text{C}$	C <sub>(porous)</sub>	5-7 V
Electro-fluorination (in solvents)	$\text{CH}_3\text{COOH} / \text{KF} \cdot \text{HF}$ ; $\text{HF} / \text{BF}_3$ ; $[(\text{C}_2\text{H}_5)_4\text{N}] \text{F} \cdot 3 \text{ HF} / \text{CH}_3\text{CN}$ ; dto/Sulpholane; dto/ $\text{C}_6\text{H}_5\text{CN}$ $[(\text{C}_2\text{H}_5)_3\text{NH}]_2\text{SiF}_6 / \text{CH}_3\text{CN}$ ; $\text{AgF} / \text{CH}_3\text{CN}$	Pt	up to 50 V

Under conditions of electrochemical perfluorination we have studied bifunctional starting compounds, e.g. mercapto alkane sulphonic acid derivatives  $\text{HSR SO}_2 \text{X}$  ( $\text{X} = \text{F}, \text{Cl}, \text{OH}$ ) chloro sulfonic acids  $\text{ClRSO}_3\text{H}$  and alkane carboxylic acids. Depending on reaction conditions we observe ring formation, isomerisation and chain fission connected with poly and perfluorination.