

## ELECTROCHEMICAL FLUORINATION OF SOME CYCLIC TERTIARY AMINES

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In the course of our research concerning the preparation of perfluorinated compounds suitable as blood substitutes, we have studied the electrochemical fluorination of N,N-diethylcyclohexylamine (DECHA) and N-ethylidicyclohexylamine (EDCHA) using the classical equipment of Simons. The two compounds behaved in a different way:

1) DECHA showed a process yield (based on the theoretical amount of the corresponding perfluoroamine) of about 51%, while the yield for EDCHA was about 16%;

2) in the case of EDCHA the reaction mixture was more complex and no identification of its components was possible; for DECHA the more significant products of the reaction, corresponding to about 65% of the total amount, were identified as:

$C_6F_{11}N(C_2F_5)_2$ (molar yield: 13.8%);	$n-C_6F_{13}N(C_2F_5)_2$ (9.5%);
$C_6F_{11}N(CF_3)C_2F_5$ (5.3%);	$C_6F_{10}HN(C_2F_5)_2$ (4.4%);
$n-C_6F_{13}N(CF_3)C_2F_5$ (4.7%);	$C_6F_{10}HN(CF_3)C_2F_5$ (0.9%).

Therefore the following remarks can be made:

- 1) a more complex structure of the molecule undergoing the electrochemical process produced lower yields, due to a greater extent of destructive side reactions;
- 2) fragmentation reactions producing ring opening were more important with respect to those involving linear chains;
- 3) hydrogen atoms belonging to carbon linked to a nitrogen atom were the last to be substituted, in accordance with the  $EC_bEC_N$  mechanism proposed for the electrochemical fluorination of organic compounds.