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14th International Symposium "Chirality 2002" (ISCD-14)

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From September 8 to 12, 2002 in Hamburg (Germany) was held the 14 th International Symposium on chirality problems which continued a series of these annual symposia held since 1988. Cochairmen of the Organizing Committee were W. A. Koenig, G. Blaschke, and V. Schurig.

The conference started with a honorary plenary lecture of D. Seebach (Switzerland) on the properties of chiral β - and γ -peptides. At the Symposium were presented 73 oral and 167 poster reports on chirality problems combined according the following topics: the nature of homochirality (B.L.Feringa, the Netherlands), chiral selectors (R.Duval, France) and isolation of enantiomers (L.Thunberg, Sweden); procedure of "dutch"-separation (R.Vries, the Netherlands), enantioselective synthesis (photoreactions, L.Scheffer, Canada), topological chirality (catenanes and rotaxanes, F.Voegtle, Germany) and supramolecular systems, chirality in pharmaceuticals (O.McConnel, USA, J.Caldwell, United Kingdom, H.-J.Federsell, Sweden) and perfumery (G.Frater, Switzerland), enantioselective receptors (N.M.Maier, Austria), enantioselective crystallization (mechanism, R.Tamura, Japan), simulation and computation methods, chirality in the biological systems (generation of chirality in the nature, R.Purrello, Italy, formation of chiral biopolymers, M.Lahav, Israel; insecticides, W.Kitching, Australia), chiroptical phenomena, isomers discrimination in NMR spectroscopy and mass spectrometry, chirality in enantiomer analysis, and general aspects of chiral molecules analysis. Some topics were presented only in poster session: spontaneous enantiomers separation (R.G.Kostyanovskii, Russia), chiral recognition (F.Toda, Japan), asymmetrical catalysis (pallado-cycles, A.S.K.Hashmi, Germani, new ligands, A.V.Korostylev, Russia, chiral ionic liquids, I.Macigewicz, Poland), enzyme catalysis, and energetics of enantiomerization.

The comparative analysis of reports presented shows that among the most important current fields of research of chiral compounds should first of all (over 40 reports) the stereoselective synthesis of new compounds or its optimization, characteristics of the

corresponding reactions, and isolation of enantiomers from natural sources. About 20 communications treated the problems of chiral catalysis, in particular, in the presence of enantioselective enzymes. For instance, in a series of communications (V.Schurig, Germany) was reported that at catalysis with enzymes (lipase) a transacylation of secondary alcohols with such reagents as isopropenyl acetate, vinyl acetate, or carboxylic acids anhydrides occurred in enantioselective mode.

Among the problems concerning enantiomers separation the most interest fairly traditionally attracted the application of various chiral phases for liquid chromatography (E.R.Francotte, Switzerland), and also the development of new chiral phases for reversed-phase highly efficient liquid chromatography (dendrimer peptides, M.Driffield, United Kingdom; polysaccharides, Y.Okamoto, Japan) and chiral additives to eluents (also over 40 reports). Therewith very seldom are encountered studies treating similar problems with respect to gas chromatography (new versions of cyclodextrins modification and preparation of chiral polymethylsiloxane derivatives). However both procedures are widely used as fairly usual methods of chromatographic enantiomers separation. The actual limitations of gas chromatography for separation of differing in the chemical nature chiral compounds originate from just the character of the stationary phases which are sufficiently polar substances with relatively poor thermal stability. The latter permitted a statement (W.A.Koenig, Germany) that one of the new chiral compounds, 1,1,4,5,8-pentakis(*tert*-butyl)octatetraene ($C_{28}H_{50}$) was apparently compound with the highest molecular weight that up till now was separated into enantiomers by means of gas chromatography. Much less studies were dedicated (on the level of developing a strategy of analysis performance) to the chiral separation by means of capillary electrophoresis.

In some reports were compared different physical methods for determination of absolute configuration of molecules (drugs, O.McConnell, USA). Among stereoselective methods of enantiomers detecting a

notable interest (more than 20 reports) attracted the use of circular dichroism spectra, and therewith the detectors in the near IR region (1750–800 nm). The other spectral methods cannot be regarded as stereoselective, the more interesting is the unique fact of revealing essential difference in peaks intensities in the FAB mass spectra of some amino derivatives [1-(1-naphthyl)ethylamine, isopropyl esters of tryptophan, proline etc.] in the presence of enantiomeric modifiers (M. Shizuma, Japan).

The number of purely theoretical studies aimed at prediction of chiral compounds properties, especially for their identification, was relatively small. Here

may be mentioned the reports on estimating barriers to rotation in molecules of diastereomers and enantiomers, but more interesting seem the results of *ab initio* calculation of optical rotation (P. J. Stephens, USA). A similar concept underlies our report dedicated to prediction of the order of diastereomers elution in the gas chromatography with the use of molecular dynamics methods. The solution of this problem is equivalent to unambiguous identification of such compounds without their preparative isolation.

The next Symposium, ISCD-15, will take place on October 20–23, 2003 in Shizuoka (Japan).