

LINEAR-DENDRITIC HYBRID OLIGOMER. SYNTHESIS AND CHARACTERIZATION.

Marisa Martinelli (1), Pablo Froimowicz (1), Miriam Strumia (1) and Alessandro Gandini (2)*

(1) Facultad de Ciencias Químicas, UNC. Córdoba, Argentina. Fax: (54)-051-4333030.

(2) Ecole Francaise de Papeterie et des Industries Graphiques, Martin D'Heres, France.

The synthesis and design of multivalent molecules has been transformed into an interest area in the last years, including the construction of polymers and similar structures that contain different functional groups. Thus, the chemistry of dendrimers is privately important, since covers the study of molecules of globular geometry, highly branched, with well defined structure in size, form and molecular weight. These composed are built through an iterative sequence of reaction steps, which conduct to upper generations structures.¹

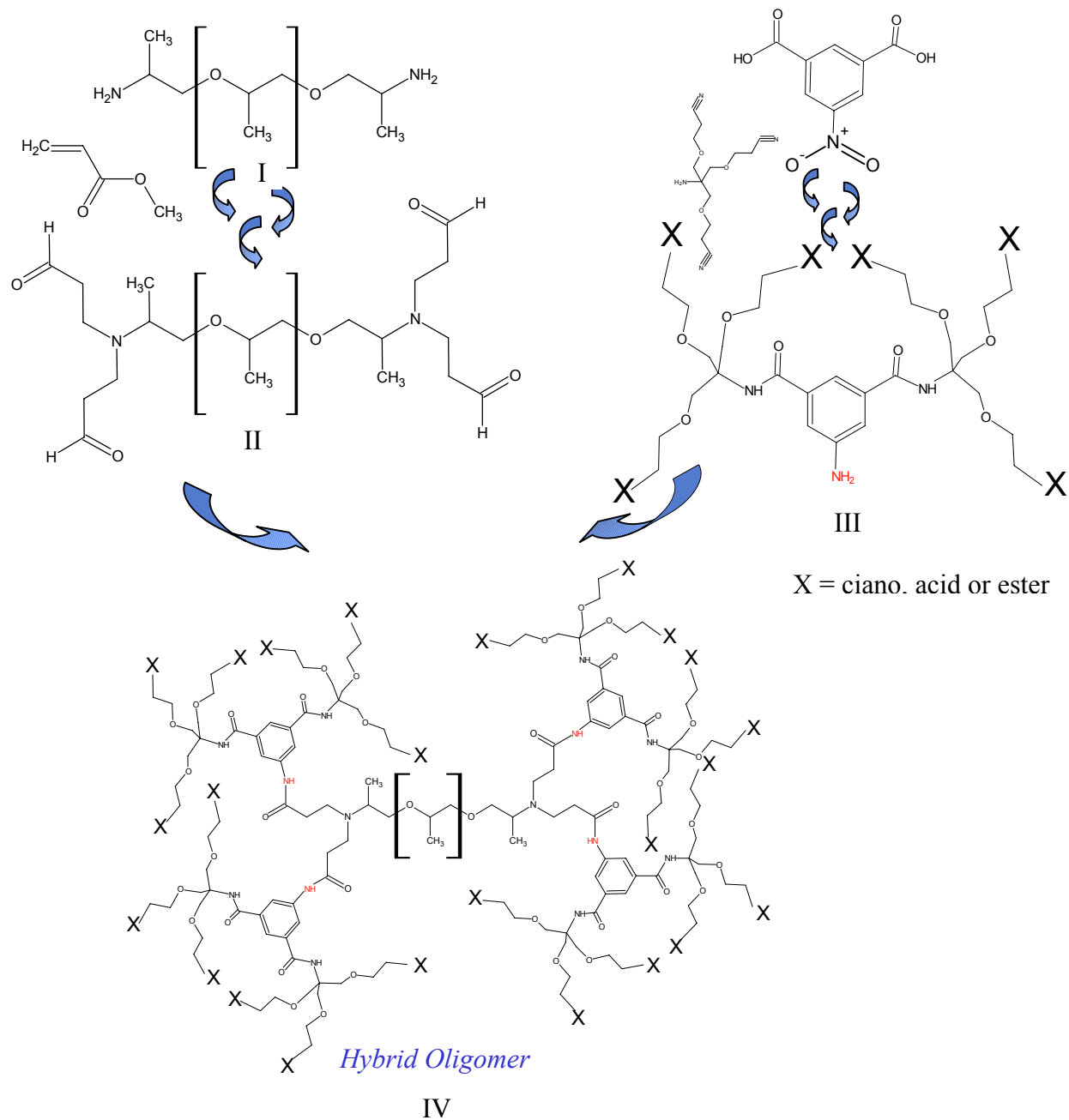
On the other hand, convenient methods for the synthesis of a new type of hybrid amphiphilic block copolymers containing both flexible (linear) and more rigid (dendritic) blocks were developed.² By changing the size of the dendrimers and the length of the linear block as well as chemical nature, products with a broad variety of desirable and useful properties might be obtained. Their properties arise from the existence of both hydrophilic and hydrophobic parts in the macromolecules, which could have many applications as phase-transfer reagents, as compounds that could potentially encapsulate other materials, and as emulsifying agents.

The objective of this study was to prepare linear-dendritic hybrid oligomers (IV), figure 1. These product was obtained by reaction of jeffamines-derivative (II) with dendritic moieties containing ciano, acid or ester terminal groups (III).

In a first approach the Jeffamines-derivative (II) with acid terminal groups was prepared through Michael-type addition using methyl acrylate followed by hydrolysis. The new dendritic molecule (III) was prepared from 5-nitroisophthalic acid as an initiator core followed by the formation of its acid chloride and further several steps to obtain different terminal groups. The last step was the reduction of the nitro group to amine. The acid terminal groups of jeffamine-derivative (III) were activated in order to promote the reaction with the amine group of the dendritic moieties to reach the hybrid oligomer (IV). The products were characterized by ¹H-MNR, ¹³C-MNR and FT-IR spectroscopy. Its behaviour in different solvents and hydrophobic-hydrophilic properties will be studied.

Finally, the synthesis of novel polymers and copolymers of that type is still of importance due to the high demand for new materials with defined architecture and improved properties.

Figure 1



Bibliography

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² a) J. van Hest, D. Delnoye, M. Baars, M. van Genderen, E. Meijer, *Science*, **1995**, 268, 1592. b) Gitsov, K. Wooley, J. Frechet, *Angew. Chem. Int. Ed. Engl.*, **1992**, 31, 1200. c) T. Chapman, G. Hillyer, E. Mahan, K. Shaffer, *J. Am. Chem. Soc.*, **1994**, 116, 11195.