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The chemistry of indigenous peoples

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The contribution of non-European cultures to science and technology, primarily to chemistry, has gained very little attentions until now. Especially, the high technological intelligence and inventiveness of South American native populations shall be put into a different light by our contribution. The purpose of this study was to show that mainly in the area of chemical practices; the indigenous competence was considerable and has led to inventions profitable nowadays to millions of people in the western world and especially to the pharmacy corporations. We would like to illustrate this assumption by giving some examples of chemical practices of transformation of substances, mainly those unknown in the old world. The indigenous capacity to gain and to transform substances shall be shown here by the manufacture of poisons, such as curare or the extraction of toxic substances of plants, like during the fabrication of manioc flower. We shall mention as well other processes of multi-stage transformations and the discovery and the use of highly effective natural substances by Amazonian native populations, such as, for example, rubber, ichthyotoxic substances or psychoactive drugs. The indigenous peoples of South America do not seem to have contributed to modern chemistry and technology. In contrast, there are some references and observations made by chroniclers and travelers from the colonial period regarding the transformation, manipulation and use of substances that require certain chemical knowledge, such as fermented beverages, dyes (pigeon peas, Urucum), and the poisons (Curare and Timbó). Even so, these populations end up being identified as "primitive savages" who still need the support of modern civilization in order for them to develop.

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The aqueous phase behavior of linear alkylbenzene sulfonate/polycarboxylate polymer systems

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Linear alkylbenzene sulfonate (NaLAS) surfactant, used in detergent products, is often combined with polycarboxylate polymers that act as anti-redisposition agents and viscosity modifiers. This work investigates the interaction of the polymer and surfactant in an aqueous system via a NaLAS-polyacrylate-water phase diagram at 50°C. It shows the multiple effects of the depletion flocculation phenomena depending upon the region of the phase diagram being considered. 2H-NMR shows that the sizes of the multilamellar vesicle structures increase with polymer concentration. This is the first time that 2H-NMR has been used to probe the diffusion and anisotropy of D_2O within the bilayers of the vesicles for such a system. The phase diagram, shown below, presents a micellar region at surfactant concentrations of up to 35 wt% NaLAS and a lamellar phase plus micellar region at higher concentrations, consistent with previous observations by Stewart and Richards. As polymer is added at low surfactant concentrations, between 10 and 20 wt% NaLAS, a non-birefringent phase is observed; perhaps a polymer rich phase resulting from depletion flocculation. At high surfactant concentrations, a second lamellar phase is also induced, different in bulk density from the original, again likely resulting from depletion flocculation of multilamellar vesicles. 2H-NMR was used to determine an increase in average multilamellar vesicle size as a function of polymer concentration. The mechanism causing this is likely a result of vesicle fusion resulting from depletion flocculation caused by polymer addition, as initially described by Van de Pas.

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