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Polymer studies with synchrotron radiation and light sources in the developing world

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Among the many applications of the intense x-ray beams from synchrotron light sources, is the use of x-ray scattering and diffraction to study polymers. This is actively pursued at more than 50 light sources now in operation around the world. Examples will be given. In addition to many in the developed world, there are active light source programs in the developing world. Particular examples include facilities in Brazil, Korea, and Taiwan which started their programs in the 1980's when they were developing countries. They came on line in the 1990's and have since trained hundreds of graduate students locally, without sending them abroad and losing many of them. They have also attracted dozens of mid-career diaspora scientists to return. Their growing user communities have demanded more advanced facilities, leading to the funding of higher performance new light sources that are now coming into operation. Light sources in the developing world now include the following: SESAME in the Middle East which is scheduled to start research in 2016, the African Light Source, in planning stage and the Mexican Light Source, also in planning stage.

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Looking back to 20th and looking forward to 21st century on physical chemistry of polymers: Needs for re-starting innovative approach

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Polymerization and fabrication of polymeric material have made phenomenal progress during the latter half of 20th century. They are key contributors to today's wide use of polymers. On the other hand, physical chemistry had used models, in place of real polymers, assuming that it would help understand physical characteristics of material. The approach made this branch of science an isolated field, separated from activities of production and application. Furthermore, models often contained un-reasonable assumption and in some case, even wild imagination. In addition, derivation of theory from assumption is so complicated that one had to face a choice of believing or leaving it. This paper is to scrutinize the past approach from the very beginning, by subject to subject. The audience is expected to be familiar with the subjects and no review is intended. The speaker was in industry for 30 years and associated with front-line people in production floor, marketing and sales. The speaker's duties were to keep up with new developments on basic science at academia and research institutes. The speaker wishes that re-starting new approaches would result in more innovation.

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