

# Isotopes for the Improvement of Industrial Products

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by Peter Schultze-Kraft

For many years the International Atomic Energy Agency has been giving technical assistance to developing countries on the application of radioisotopes in medicine, agriculture and hydrology. With increasing industrialization, these countries feel a growing need for the use of isotopic methods as a means of improving the control of production processes and the quality of industrial products. In response to the demand for training in this field, the IAEA recently held its first Regional Training Course in the Practical Use of Radioisotope Techniques in Industry for Process and Quality Control.

The course was given from 27 March to 28 April 1978 at the Instituto Venezolano de Investigaciones Científicas (IVIC) in Caracas, Venezuela, in co-operation with the Consejo Nacional para el Desarrollo de la Industria Nuclear (CONAN) and the Junta del Acuerdo de Cartagena. It was financed jointly by the IAEA and CONAN, and in addition received a special contribution by the Government of the Federal Republic of Germany. Participants were 18 engineers and physicists from Bolivia, Chile, Colombia, Ecuador, Peru and Venezuela, and the lecturers came from Denmark, Federal Republic of Germany, Poland and the host country. Course directors were Dr. J.J. Henríquez (IVIC) and Dr. L. Wiesner (IAEA expert).

The idea of the course was to demonstrate that radioisotope techniques can considerably reduce production costs by optimizing industrial processes and making more efficient use of raw materials. It is estimated that the paper industry in the USA, for example, is saving about 100 million dollars per year through the application of radioisotopes.

During the training course, the participants gained practical experience in applying isotopic techniques in several fields: in a paper mill at Morón they measured the weight per surface area, and in the cement factory of Ocumare del Tuy the residence time of clinker, at the new international airport of Maiquetía they determined the compactation densities of the runways, and in the tobacco factory in Maracay they obtained information how the whole production process is already controlled and automated by continuously measuring the filling of the rapidly moving tobacco strand with a radioactive source.

In steel production, the sulphur content is of decisive importance for the quality and the mechanical properties of the product. For the reduction of the sulphur concentration, it is necessary to know where this chemical element in the steel is coming from. This can only be investigated through radioisotopic tracer methods. Such an experiment was performed during the training course at the SIDOR steel plant of Ciudad Guayana.

Further experiments were carried out in the rubber, chipboard, animal feed and metallic industries. The practical demonstrations and experiments were preceded by lectures and laboratory exercises on the basic principles of radioisotopic methods, including radiation protection aspects.

It is hoped that the IAEA's next regional training course of this type can be held in 1979 in Kuala Lumpur, Malaysia, for the Asia and the Pacific area.

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