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Water – valuable and worth protecting! Accelerated electrons assist in the treatment.

At the Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP, one of the leading partners for research and development in the field of electron beam applications, methods and machines based on these technologies are developed for the use in medicine and pharmacy as well as for the protection of resources and the environment. The Nuclear and Energy Research Institute (IPEN) in São Paulo, Brazil, is the leading Brazilian institution for environmental technologies and renewable energy. Both institutes intend to cooperate now and will present – among other things – their fields of expertise for effective water treatment during a workshop on 6th and 7th November 2017 at IPEN, in São Paulo, Brazil: AcEL - ACCELERATED ELECTRONS FOR LIFE.

Our wastewater passes a difficult treatment process with the aim of receiving clean drinking water at the end. However, in a recent press release ^[1] the Verband kommunaler Unternehmen (VKU, German Association of Local Utilities of municipally determined infrastructure undertakings and economic enterprises) pointed out clearly that after mechanical, biological and chemical treatment, and even after passing through a fourth cleaning stage in modern sewage cleaning plants, micro elements can only be reduced but never be removed completely. Thus, the VKU handed a policy paper over to the German Federal Ministry for the Environment in which they ask for a responsible handling of micro elements. For protecting the drinking water resources as best as possible, micro elements have to be avoided at an early stage or be at least reduced.

All over the world, scientists search for methods for the sewage treatment. Fraunhofer FEP and IPEN have taken on this task as well. They are using accelerated electrons for cleaning the water.

“Low-energy electrons are a multifunctional tool which we use successfully for sterilization or to dispose of residues of hormones and pharmaceuticals in the sewage water.” explains Frank-Holm-Rögner, head of the department electron beam processes, the approach of Fraunhofer FEP. “These treatment methods are not only economically superior to most other methods but also in regard to their respective use of energy and resources.

The scientists of Fraunhofer FEP are already experienced in effectively treating small amounts of liquids in laboratory-scale. Now, they want to optimize the method for higher amounts of sewage water. First, they will concentrate on compact solutions for treating

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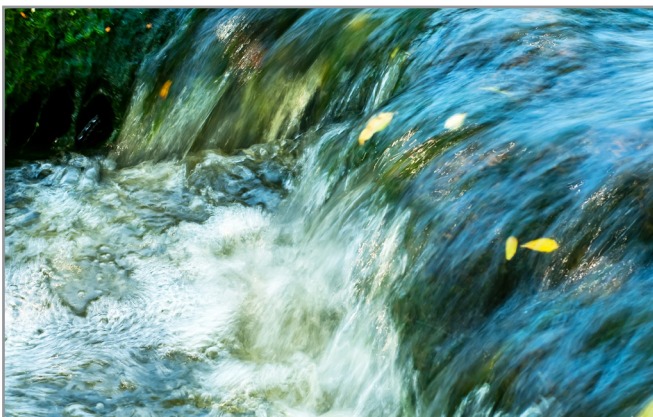
small amounts of liquids close to the polluter. The treatment of high concentrated contaminations is significantly more effective than the treatment of huge amounts of water with a low contamination level in a sewage cleaning plant. Developing a new, compact electron accelerator in the middle energy area of up to 600 kilo-electron-volt (keV) is part of the development approach.

The Brazilian partner institute IPEN already achieved positive results in the treatment with high energy (up to 10 MeV). Dr. Wilson Aparecido Parejo, general director of IPEN, is certain: "Our fields of expertise complement each other in an ideal way. We can combine them for the protection of the environment and thus contribute to the protection of the vital resource water."

Both institutes present – together with further partners – those fields of expertise as well as other environmental technologies during a workshop on **6th and 7th November 2017**, at IPEN in São Paulo, Brazil: **AcEL - ACCELERATED ELECTRONS FOR LIFE**.

Partners of industry and research may benefit from this event to discuss the efficient application of these technologies. Decision makers from policy and economy may also have an important information platform. The aim of the workshop is to use the innovational potential of accelerated electrons for the protection of the environment and to further implement it in practice.

The workshop is supported by the German House for Research and innovation - São Paulo as well as by the National Nuclear Energy Commission (CNEN) and CNPq – Conselho Nacional de Desenvolvimento Científico e Tecnológico.



Water– valuable and worth protecting!

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About AcEL

Fraunhofer FEP and IPEN will present technologies for water treatment in São Paulo: from 6th to 7th November 2017 both institutes will organize and offer the workshop “AcEL - ACCELERATED ELECTRONS FOR LIFE” supported by the German House for Research and Innovation (DWIH). The workshop will take place at the premises of IPEN located at the University of São Paulo and has the aim to bring together specialist from industry and decision makers from policy and industry to discuss latest technologies using accelerated electrons e.g. for environmental technologies like water treatment as well as for the production of vaccines or seed treatment.

About IPEN

The Nuclear and Energy Research Institute (IPEN) is a Brazilian institution, supported and administrated technically and financially by the National Nuclear Energy Commission (CNEN). It is recognized as a national leader institution in R&D areas of radiopharmacy, application of ionizing radiation, nuclear science and technology, nuclear reactors and fuel cycle, environmental science and technology, renewable energies, materials and nanotechnology, biotechnology, laser technology and education. The Institute will celebrate its 61st anniversary in August 2017. IPEN-CNEN/SP Nuclear Technology Graduate program in association with USP, completed 40 years of existence in March, 2016. The Radiation Technology Centre (CTR) at IPEN-CNEN/SP was founded 45 years ago, spreading and consolidating the techniques that lead to radiation technology and radioisotopes applications in Industry, Human Health, Agriculture and Environment Preservation in Brazil. The scientific knowledge production, human power resources, technology transfers and generation of products and services are aimed to various segments of the Brazilian Society.

About the German House for Research and Innovation – Sao Paulo

The German House of Science and Innovation - São Paulo (DWIH-SP) was created in 2009 by the German Federal Foreign Office (AA), in cooperation with the Ministry of Education and Research (BMBF). The goal is to increase the visibility in Brazil of Germany as a scientific and technological center and foster synergy and exchange between German and Brazilian scientific institutions - particularly in São Paulo, the largest center of German industry outside Germany.

Both Germany and Brazil consider science and innovation to be key areas for ensuring economic, social and sustainable environmental development. For over 40 years, the two countries have promoted comprehensive and fruitful scientific cooperation. With the opening of DWIH-SP, Germany took an important step towards strengthening ties with its Brazilian partners.

DWIH-SP brings together representatives of several German institutions of research and

funding in one space, presenting Germany as a partner of excellence and high competitiveness in science and innovation. As an important center of reference and mediation for people and institutions from Brazil and Germany, related to themes such as higher education, science, research and innovation on scientific bases, the DWIH-SP contributes, through its activities, to the sustainable, social e economic development of both countries.

About Fraunhofer FEP

Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP works on innovative solutions in the fields of vacuum coating, surface treatment as well as organic semiconductors. The core competences electron beam technology, sputtering, plasma-activated deposition and high-rate PECVD as well as technologies for the organic electronics and IC/system design provide a basis for these activities.

Thus, Fraunhofer FEP offers a wide range of possibilities for research, development and pilot production, especially for the processing, sterilization, structuring and refining of surfaces as well as OLED microdisplays, organic and inorganic sensors, optical filters and flexible OLED lighting.

Our aim is to seize the innovation potential of the electron beam, plasma technology and organic electronics for new production processes and devices and to make it available for our customers.