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URANIUM TRANSFER TO VEGETABLES: DESIGN AND TEST OF A HYDROPONIC SYSTEM.

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This project is part of the larger and more ambitious one: "Study of uranium biodistribuition in the food chain", which involves experimentation with mammalians (Wistar rats and Beagle dogs), fishes and vegetables (present work), plus extrapolation to humans by means of the General Multiple - compartments Model.
The main idea underlying this project is the simulation of a common real-life scenario, where uranium from fertilizers is transferred to plants and from them to humans. In this regard, a hydroponic system was designed and tested; its main components are:
1) several cubic water containers, 25ℓ capacity, with 15ℓ of argil stones each (to sustain plants);
2) heaters monitored by electronic controllers, in order to keep water temperature constant;
3) electromagnetic pumps to maintain oxygen in the water at normal levels; and an
4) illumination system that mimics a natural photoperiod, controlled by a timer.
A pilot experiment has been initiated with Brazilian lettuce, one weak sowed in a special ground convenient for sowing. Three hydroponic containers were set-up with 12 lettuce plantules (one week old) each. Plant nutrient solutions doped with uranyl nitrate at 20 and 60 ppm concentrations, plus a uranium-free solution, were prepared and administered to each of the 3 groups of lettuces, respectively.
The following parameters were kept constant, or nearly constant: water temperature at $(21\pm_1)$ ^{0}C; water electric conductivity at 2.0 mS, and photoperiod equal to 15h.
One plant from each container is collected every week, its parts are separated (root, leaves, thallus, caulis and veins) and then they are incinerated. The ashes are dissolved in nitric acid; aliquots from these solutions are dropped on Makrofol foils and dried up. These biological samples are irradiated with neutrons near the core of the IPEN/CNEN research reactor (IEA-R1, 5MW, pool type) and the uranium content is determined by the fission track counting technique. These results will make possible to obtain the U transfer coefficients for each part of the plant, as a function of both time and U concentration in the nutrient solution. This is, in principle, the maximum of information one can get for a detailed and complete biokinetics study.

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Influence of a Floating Electrode on the Behaviour of Resistive Detectors in the Proportional and SQS Region

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Introduction

In this work we consider mainly the rate effects associated with the gain and/or the efficiency of detectors with resistive electrodes. Previous results [1,2] showed that the loss of pulse height that is observed when such a resistive detector is operated under increasing detector current can only be ascribed to the reduction of the effective voltage difference across the gas. Indeed, as a consequence of the resistance of the lossy dielectric that constitutes the cathode, the voltage applied is reduced by a predictable amount which can be easily computed under the assumption