

## **Modeling of organically-bound tritium build-up in crops after exposure to atmospheric HTO in greenhouse environment**

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The regression model is presented for organically-bound tritium build-up in crops exposed to HTO atmosphere. The processes of tritium uptake, losses, transformation and transport are examined for such crops as potatoes, tomatoes, lettuce and wheat. For developing the model, the experimental data on plants' short-term exposure to HTO-containing atmospheric moisture in greenhouse environment were used. The plants were exposed in the linear growth phase of storage organs during the period between blossoming and ripening.

The developed regression model allows describing processes of tritium uptake and losses in leaves as well as transformation and transport of organically bound tritium (OBT) to storage organs. The processes of tritium build-up and losses by leaves are described due to first-order kinetic equations. To describe the variation dynamics of plant biomass, the logical function of growth was introduced. The processes of OBT translocation and build-up in storage organs were calculated under the assumption that the constant OBT fraction generated in leaves moves to the growing organ. The constants needed for calculations were acquired from processing of experimental data on each of the plants by using the regression analysis method.

The model was verified by using the results of available experiments in plant exposure. The model can be applied to determining the OBT activity in storage organs of plants upon short-term release of tritium in the form of HTO into the atmosphere.