物理

氚长期大气释放的剂量评价模型

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摘要　　描述了一改进的氚长期大气释放剂量评价模型，该模型是建立在氚化水(HTO)从空气向植物和动物产品中的HTO和有机氚（OBT）迁移的保守假设上，考虑了氚的两种不同形态。在计算植物产品中氚的浓度时分为叶类和非叶类产品，同时考虑了土壤中氚对不同种类植物氚浓度的贡献率；对动物产品中HTO浓度计算时，考虑了不同水源份额的平均权重以及动物产品的含水量，这些水源包括皮肤吸收、呼吸、饮用和食物。在剂量计算时除了考虑食入途径，还考虑呼吸和皮肤吸收对人的剂量贡献。通过与比活度模型和NEWTRI模型比较，表明该模型能更好地反映氚长期释放后通过食物链对人造成的剂量贡献。

关键词　　氚　长期大气释放　剂量评价模型

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Dose Assessment Model for Chronic Atmospheric Releases of Tritium

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Abstract An improved dose assessment model for chronic atmospheric releases of tritium was proposed. The proposed model explicitly considered two chemical forms of tritium. It was based on conservative assumption of transfer of tritiated water (HTO) from air to concentration of HTO and organic beam tritium (OBT) in vegetable and animal products. The concentration of tritium in plant products was calculated based on considering dividedly leafy plant and not leafy plant, meanwhile the concentration contribution of tritium in the different plants from the tritium in soil was taken into account. Calculating the concentration of HTO in animal products, average water fraction of animal products and the average weighted tritium concentration of ingested water based on the fraction of water supplied by each source were considered, including skin absorption, inhalation, drinking water and food. Calculating the annual doses, the ingestion doses were considered, at the same time the contribution of inhalation and skin absorption to the dose was considered. Concentrations in foodstuffs and dose of annual adult calculated with the specific activity model, NEWTRI model and the model proposed by the paper were compared. The results indicate that the model proposed by the paper can predict accurately tritium doses through the food chain from chronic atmospheric releases.

Key words   tritium 　 chronic atmospheric releases 　 dose assessment model

通讯作者