

SUMMARY:

Thallium is a nonessential element, more toxic than mercury, lead, cadmium, zinc or copper. It exists in the two oxidation states Tl^+ and Tl^{3+} . Thallium is toxic to all organisms in both monovalent and trivalent form. In biological processes it can substitute K^+ due to their similar ionic radii. In the past it was extensively used for medicinal purposes and as a rodenticide. In the present there are over 150 uses and potential applications for thallium and its compounds. Thallium is generally present in very low concentrations (less than 1 mg.kg^{-1}), however, in artificially polluted areas (in the vicinity of power plants, cement factories, smelting works, sulphide ore wastes from mining activity and others) it may exceed much higher levels. The amount of thallium of natural origin strongly depends on the lithology of the parent rock on which soil was derived. Detection of thallium in soils is usually performed by ICP-MS. The total intake of thallium should be less than $5 \mu\text{g}$ per day, but no recommended maximum values are available in the present time in most countries. Different soil properties can influence the behavior of thallium. Through uptake by plants thallium is entering the food chain. Plant varieties and plant parts differ in the degree of uptake and accumulation of thallium, thus, in Tl-rich areas suitable crops should be planted accordingly.