Waste input-output model at substance level

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This study proposes a waste input-output model at the substance level (WIOS) that take the substance composition of wastes into account. This new model is based on the waste input-output model and disaggregates the waste into substance level. Because the change of substance composition in the waste treatment processes potentially affects the life cycle inventory of waste treatment, the proposed model is expected to obtain more accurate results than the hybrid models that did not consider the substance composition. In addition, this model provides a method to trace the substances of waste in treatment processes by using hybrid input-output model. The WIOS is applied to wastewater treatment. We use the German input-output table and the data of wastewater treatment processes to illustrate. The calculation result shows that the change of substance composition significantly affects the total environmental loads caused by wastewater treatment. The environmental loads are different with the simulation result given by current existing hybrid input-output models that did not consider the change of substance composition in wastewater.