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Chemical Footprint of Brazil: A Case of Study of Dioxins and Furans

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Abstract

Dioxins and Furans are part of the Persistent Organic Pollutants (POPs) with high potential to cause harmful impacts to humans and the environment. Considering that life quality is negatively affected by the presence of these substances into the environment, this paper calculates the potential damages to human health based on the USEtox risk model and the Brazilian inventory of Dioxins and Furans. The potential damage to health is indicated by the chemical footprint of the Brazilian states, which is associated with geographic and demographic characteristics of each region. The total calculated impact score for Brazil is 621 DALY, the state of São Paulo (SP) is the first in the ranking with 27% of the calculated impact, followed by Minas Gerais with 16%, Rio de Janeiro with 12%, Espírito Santo with 10%, Pará with 7%, Paraná with 4%, Rio Grande do Sul and Mato Grosso with 3% each. These eight states concentrate 80% of the impacts caused by Dioxin and Furan emissions. The impact score indicates the potential impacts on human health and is an alternative reference for ordering the emission source categories and can aid in decision making for public policies. The impact scores based on the population $IS_{pcapita}^{UF}$, the Gross Domestic $IS_{\UF , and the area $IS_{km^2}^{UF}$ show a significant variation when comparing the ranking of each indicator, and it is possible to use them jointly or individually to compare the chemical footprint of the states.

Keywords: LCIA, Chemical Footprint, Dioxins and Furans, USEtox.