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Environmental hazards of Photovoltaic perovskites

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The CH₃NH₃Pbl₃ perovskite, is currently the most promising compound in photovoltaic (PV) technologies for making highly efficient solar cells because of their simple fabrication procedure, low price, and high efficiency. Several companies are already building perovskite-based PV devices for commercialization in the near future. Nevertheless, the perovskite contains Pb, and safety concerns during PV fabrication and transportation have not yet been addressed. But not only direct human exposure is an issue, but its release into the environment, soil and waterways, after failure of large area solar cells also represents major health risks. Here an extensive toxicity study of the most promising photovoltaic perovskites $CH_3NH_3PbI_3$ and $CH_3NH_3SnI_3$ are presented. On cell cultures, the zoom-in *in vitro* (modification of the genes upon perovskite exposure, biochemical changes, various assays) and on living organisms (C-elegans and Drosophila) the zoom-out in vivo studies both show a high level of toxicity. The results are conclusive and encouraging the scientific community to conduct further tests on more complex organisms, but also to search for new materials which do not represent risk to the environment.

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