

1 Assessment of the environmental persistence 2 and long-range transport of endosulfan¹

3 Linus Becker, Martin Scheringer, Urs Schenker, Konrad Hungerbühler

4 Institute for Chemical and Bioengineering, ETH Zürich, CH-8093 Zürich, Switzerland

5 Corresponding author: Martin Scheringer, scheringer@chem.ethz.ch

6 ABSTRACT. Concentrations of the insecticide endosulfan (α - and β -isomer) and its
7 degradation product endosulfan sulfate in air, seawater and soil are calculated with the
8 global environmental fate model CliMoChem. As model input, physicochemical
9 properties of all three compounds were assembled and a latitudinally and temporally
10 resolved emission scenario was generated. For concentrations in air, model and
11 measurements are in good agreement; a bimodal seasonality with two peaks in spring
12 and fall as it is observed in Arctic air is reproduced by the model. For seawater, the
13 agreement of model and measurements depends on the values of the hydrolysis
14 activation energy of endosulfan used in the model; with relatively high values around
15 100 kJ/mol, model results match field data well. The results of this assessment of the
16 levels, persistence, and global distribution of endosulfan are also relevant for the
17 evaluation of endosulfan as a Persistent Organic Pollutant under the Stockholm
18 Convention.
19 CAPSULE: Levels of endosulfan in air, seawater and soil measured in the global
20 environment are well reproduced by a global environmental fate model.
21 KEYWORDS: endosulfan, long-range transport, persistence, environmental fate

¹ Accepted for publication in *Environmental Pollution* (2011). The full paper is available from the authors on request (scheringer@chem.ethz.ch).