

Exercise 1 – Hazard Identification

Objective:

The goal of this exercise is for students to assess the potential hazards associated with selected plastic additives. Students will use the resources and tools introduced in the class to gather data on four key properties: persistence, bioaccumulation potential, mobility, and toxicity. Based on this information, students will determine whether the plastic additives possess concerning properties and explain why.

Instructions:

1. **Use Class Resources to Collect Data:** Utilize the resources introduced in the class to gather relevant data about your plastic additives, along with toxicological reports or material safety data sheets (MSDS), and scientific literature (journal articles, reports, and other publications).
2. **Assess the Four Key Properties:**
 - **Persistence:** Look for information on how long the additives remain in the environment. Does it break down easily or persist for extended periods in the soil, water, or air? Identify any available half-life data and degradation rates. Key sources include: OECD eChemPortal, ECHA Registration dossiers, OECD QSAR Toolbox, and US EPA CompTox database and tools.
 - **Bioaccumulation Potential:** Determine whether the additives have the potential to accumulate in living organisms, particularly in aquatic organisms or through the food chain. This could involve studying its octanol-water partition coefficient (K_{ow}) or bioconcentration factors (BCF). Key sources include: OECD eChemPortal, ECHA Registration dossiers, OECD QSAR Toolbox, and US EPA CompTox database and tools.
 - **Mobility:** Evaluate the additives' ability to move through water. Consider its solubility and K_{oc} in various ecosystems. Key sources include: OECD eChemPortal, ECHA Registration dossiers, OECD QSAR Toolbox, and US EPA CompTox database and tools.
 - **Toxicity:** Investigate the potential toxic effects of the additives on humans, wildlife, and the environment. Look for acute and chronic toxicity data, such as LD50 (lethal dose), eco-toxicity studies, and carcinogenicity. You may also want to check for known effects like skin irritation, endocrine disruption, or reproductive toxicity. Key sources include: OECD eChemPortal, ECHA Registration dossiers, and ECHA C&L inventory.