**Supplementary material**

**Table S1** Characteristics and basic properties of the studied pesticides [34,35]

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No | Analyte | Chemical formula | Substance Group | Type of action | Mode of action | Human health issues | Molecular mass  [g mol-1] | Solubility in water at  20 °C [mg L-1] | Dissociation constant (pKa)  at 25 oC | log Pa at pH 7, 20 °C |
| 1. | Boscalid | C18H12Cl2N2O | Carboxamide | Fungicide | Systemic | Toxic to liver and thyroid, possibly carcinogen | 343.21 | 4.6 | - | 2.96 |
| 2. | Captan | C9H8Cl3NO2S | Phthalimide | Fungicide, bactericide | Non-systemic | Inhibition of oestrogen action, skin and eye irritant | 300.61 | 5.2 | - | 2.5 |
| 3. | Cypermethrin | C22H19Cl2NO3 | Pyrethroid | Insecticide | Non-systemic | Highly toxic, estrogenic effect, respiratory tract irritant, eye irritant, possibly toxic to liver and kidney | 416.30 | 0.009 | - | 5.55 |
| 4. | Cyprodinil | C14H15N3 | Anilinopyrimidine | Fungicide | Systemic | Skin and eye irritant, respiratory tract irritant | 225.29 | 13 | 4.44 (weak base) | 4.0 |
| 5. | Fludioxonil | C12H6F2N2O2 | Phenylpyrrole | Fungicide | Non-systemic | Toxic to liver and kidney, skin and eye irritant | 248.19 | 1.8 | 0 (pKa(1) base; pKa(2) 14.1 acid) | 4.12 |
| 6. | Pirimicarb | C11H18N4O2 | Carbamate | Insecticide | Systemic | Ache inhibitor, neurotoxic, eye irritant | 238.39 | 3100 | 4.4 (weak base) | 1.7 |
| 7. | Propiconazole | C15H17Cl2N3O2 | Triazole | Fungicide | Systemic | Respiratory tract irritant, liver toxicant, weak oestrogen and aromatase activity inhibition | 342.22 | 150 | 1.09 (very weak base) | 3.72 |
| 8. | Tebuconazole | C16H22ClN3O | Triazole | Fungicide, plant growth regulator | Systemic | Eye irritant, reproductive effect, targets liver/blood system | 307.82 | 36 | 5.0 | 3.7 |

Legend:

- no dissociation

aOctanol-water partition coefficient at pH 7, 20 °C

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**Figure S1** Microscopic images (magnification 40x) of apple peel fragments before testing (a), after 5 hours (b) and 24 hours (c) of pesticides permeation, obtained with a Nikon Eclipse TS100 F inverted microscope

**Figure S2** Relationship between the level of permeation after 24 hours of spraying and the reciprocal of the logP value of the tested pesticides with SD values, n=3, applied dose of 0.5 mg