

**Suppplementary Fig. 1.** Black line indicates the total ion chromatogram (TIC) of control BS matrix after freezing at -20 °C for 30 min, Pink line indicates TIC of control BS matrix after freezing at -20 °C for 60 min, Blue line indicates TIC of control BS matrix after freezing at -80 °C for 10 min, Green line indicates TIC of BS matrix after freezing at -80 °C for 20 min.

|  |  |
| --- | --- |
| Before Freezing | After freezing |
|  |  |

**Supplementary Fig. 2a.** False detection of dichlorvos without freezing due to lack of matching of the ion ratio criteria in BS matrix

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| Before Freezing | After freezing |
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**Supplementary Fig. 2b.** False detection of parathion without freezing due to lack of matching of the ion ratio criteria in BS matrix

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| Before freezing | After freezing |
|  |  |
| 3a. Chlorothalonil | |
|  |  |
| 3b. Oxyfluorfen | |
|  |  |
| 3c. Chlorfenapyr | |
|  |  |
| 3d. Fipronil | |

**Supplementary Fig. 3.** Peak shape before and after freezing of a) chlorothalonil, b) oxyfluorfen, c) chlorfenapyr and d) fipronil in BS matrix

**Supplementary Fig. 4.** Presentation of matrix effect (%) of selected pesticides in three different soil matrices

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| 5a. Dieldrin (BS) | 5b. p,p'-DDT (RS) | 5c. Dichlofluanid (NAS) |

**Supplementary Fig. 5.** Peak nature of some problematic compounds