SOLID-PHASE EXTRACTION OF PESTICIDES 5.3

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Samples collected for analysis of dissolved pesticides can be processed at the laboratory or onsite through a column containing pesticide-specific sorbents. Onsite solid-phase extraction (SPE) is useful, especially at remote sites, because pesticides isolated on the sorbent are less susceptible to degradation than when in water. Also, the SPE cartridges are less expensive to ship than water samples. However, onsite SPE is not required, and in some situations, laboratory SPE might be preferred.

All SPE methods require that the water sample be filtered (section 5.2.2.A) as soon as possible after collection. General equipment and supply needs for SPE for a broad-spectrum analysis of pesticides are listed in table 5-7 and general instructions are given in sections 5.3.1 and 5.3.2. More detailed information on SPE methods and procedures can be found in Sandstrom and others (1992), Sandstrom (1995), Zaugg and others (1995), Lindley and others (1996), and Werner and others (1996).

- Filter the environmental sample (section 5.2.2.A): this is necessary to prevent blockage of the SPE column by particulate material.
- Process the pesticide sample through an SPE column within 4 days of collection.
- Determine the reagents needed for the SPE method to be used (for example, conditioning solution, surrogate solution, and field-matrix spike solution).

Table 5-7. Checklist of general equipment and supplies required for broad-spectrum pesticide analysis by onsite solid-phase extraction

[SPE, solid-phase extraction; mm, millimeter; µL, microliter; µm, micrometer; mL, milliliter; NWQL, National Water Quality Laboratory]

✓	General equipment and supplies[1]	Description	Number required
	Aluminum foil	Heavy duty	1 box
	Blank water[2]	Pesticide grade (NWQL)	4 L
	Filter media	Glass microfiber, 147-mm diameter, 0.7-µm pore diameter, precleaned[3]	1 per sample
	Detergent, nonphosphate laboratory	0.2-percent solution	4 L
	Glass bores	Disposable, for 100-µL micropipet	ample supply
	Gloves, disposable	Powderless, latex or nitrile, assorted sizes	ample supply
	Graduated cylinder or beaker	50 mL, glass	2
	Luer™ connector[2], Tefzel™ male	P-625	1 or more
	Metering pump, valveless, piston-type	FMI Model RHB OCKC	1
	Methanol	Pesticide grade (NWQL)	4 L
	Micropipet	Fixed volume (100 µL)	1 or more
	Nut and union[2], Tefzel™	P-623	1 or more
	Plastic beaker	1 L, for collecting extracted water	1 or more
	Plate-filter assembly	147-mm diameter, aluminum or stainless steel	1
	Portable balance	(Check method for weight requirements.)	1
	Sample bottles[3] and vials (40 mL)[2]	Amber glass, precleaned	1 per sample
	SPE column adapter[2]	(Check method requirements)	1 or more
	SPE columns, precleaned[2]	C-18: Analyticum™ C-18, 500 mg; Carbopak-B™, 500 mg; Other: as required	1 or more of each, as required
	SPE solutions[2]	(Check method requirements for conditioning, surrogate, and spike solutions)	as required by method
	Stopwatch	Standard	1
	Wash bottle, fluorocarbon polymer	250 mL, for methanol	1
	Wash bottle, fluorocarbon polymer	250 mL, for pesticide-grade water	1

[1]Filtration equipment and supplies are described in section 5.2.2.A, table 5-5, and figure 5-1.

[2]Supplies ordered by USGS personnel through E-mail to NWQL-DENSUPPL.

[3]Supplies ordered by the USGS personnel from Quality of Water Service Unit in Ocala, Fla. (QWSU).