Redefining Environmental HPLC

Pesticides & Herbicides

HPLC is the method of choice for the separation of several classes of pesticides that are highly polar, thermally labile, and non-volatile. The bonded phases employed for such analyses must possess a shielded silica surface and uniform coverage as well as a high degree of reproducibility from lot-to-lot. Restek's Pinnacle" HPLC columns exhibit excellent selectivity and low adsorptivity for several classes of pesticides, including anticoagulant pesticides, carbamates, uron herbicides, and triazine herbicides.

Anticoagulant Pesticides

Although highly effective at controlling rodents, the anticoagulants shown in Figure.1 pose a serious threat to livestock, pets, and humans. These compounds prevent blood clotting, which may cause death by hemorrhage. Traditional analyses used a time-consuming ion-pair method and a standard ODS column. Although complete resolution is achieved, the analysis takes 2 1 minutes and diphacinone and chlorophacinone exhibit severe tailing. By using Restek's Pinnacle"' ODS Amine column and a simple binary gradient, all eight components elute in less than 10 minutes with excellent peak symmetry. The new method doubles sample throughput and improves quantitative reliability.

Figure 1: Pinnacle" ODS Amine resolves anticoagulants in less than 10 minutes- a 50% savings in analysis time!

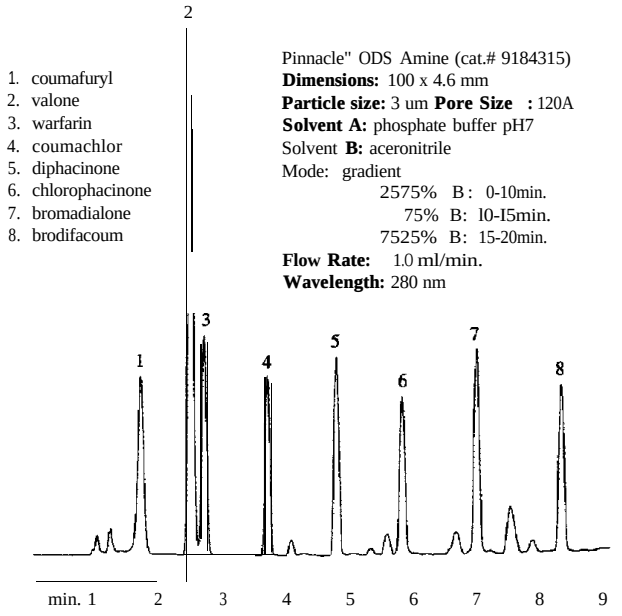
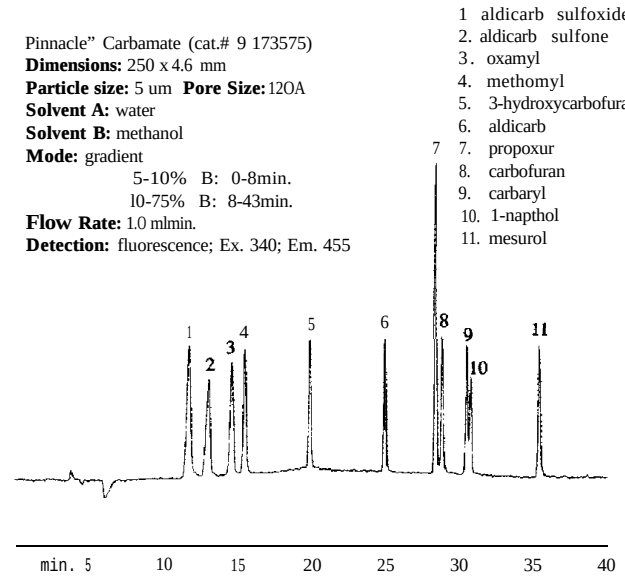


Figure 2, The Pinnacle Carbamate column offers optimized selectivity for free carbamate pesticides.



Carbamates

Carbamate pesticides have been regulated by the U.S. EPA because they leach into ground waters. Drinking water must be monitored to determine if carbamate levels exceed the proposed limits of 0.003 to 0.2 mg/L. The Pinnacle" Carbamate column offers selectivity for free carbamates that is not available with standard bonded phases. Coupled with post column derivitization and fluorescence detection, this column is a powerful tool when performing EPA Method 531.1 as shown in Figure 2.

Uron Herbicides

Uron herbicides act as weed-controlling agents by inhibiting photosynthesis after being absorbed through the weed root system. Their presence in the environment poses a threat since these compounds have been shown to cause anemia and methemoglobinemia in laboratory animals. Figure 3 demonstrates that the Pinnacle" EcoSep column is optimized for the separation of these analytes with a simple four-minute isocratic method. Although not shown, an improved resolution of isoproturon and diuron in the gradient mode is obtained by using the EcoSep column.

Triazine Herbicides

Selective weed control may be accomplished with triazine herbicides in either a post- or preemergence capacity. Livestock that have ingested

these compounds exhibit muscular spasms, increased respiratory rates, and internal organ damage. Since these herbicides are commonly used in the production of edible crops such as peas, potatoes, and pineapples, their determination at levels as low as 10 to 20 ppm is essential. An effective gradient method that resolves all components in under 25 minutes has been developed using a Pinnacle"" Octyl Amine column (Figure 4).

Figure 3: Pinnacle" Sep exhibits excellent selectivity for **Uron Herbicides.**

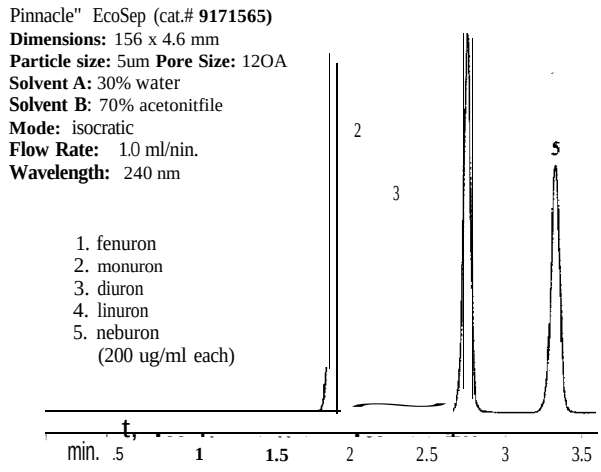
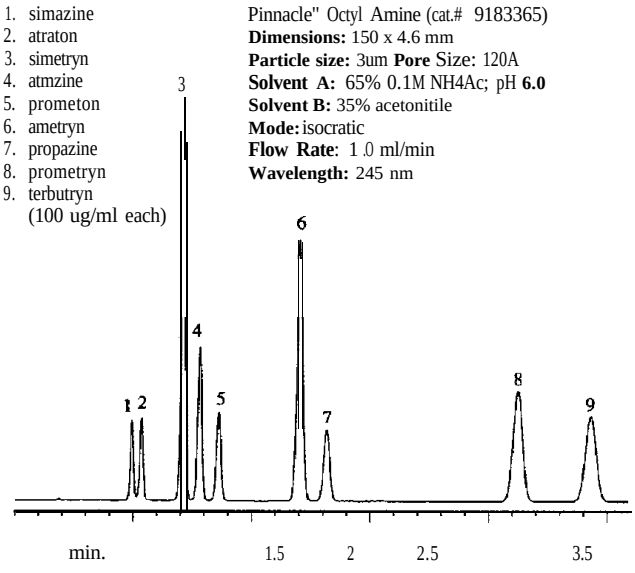


Figure 4: Pinnacle" Octyl Amine allows rapid separation of **triazine herbicides.**



PINNACLE HPLC

Pinnacle™ Carbamate

4.6mmID

particle size	length (mm)	cat.#
	250	9173575

Pinnacle™ EcoSep

3.2mmID

particle size	length (mm)	cat.#
5um	50	9171553
5um	100	9171513
5um	150	9171563
5um	200	9171523
5um	250	9171573

4.6mmID

particle size	length (mm)	cat.#
5um	50	9171555
5um	100	9171515
5um	150	9171565
5um	200	911525
5um	250	9171575

Pinnacle" Octyl Amine

3.2mm ID

particle size	length (mm)	cat.#
Wm	100	9183313
3um	150	9183363
3um	200	9183323
5um	100	9183513
5um	150	9183563
5um	200	9183523
5um	250	9183573

4.6mm ID

particle size	length (mm)	cat.#
3um	100	9183315
3um	150	9183365
3um	200	9183325
5um	100	9183515
5um	150	9183565
5um	200	9183525
5um	250	9183575

Pinnacle" ODS Amine

3.2mm ID

particle size	length (mm)	cat.#
3um	5	9184353
3um	100	9184313
3um	150	9184363
3um	200	9184323
5um	50	9184553
5um	100	9184513
5um	150	9184563
5um	200	9184523
5um	250	9184573

4.6mm ID

particle size	length (mm)	cat.#
3um	50	9184355
3um	100	9184315
3um	150	9184365
3um	200	9184325
5um	50	9184555
5um	100	9184515
5um	150	9184565
5um	200	9184525
5um	250	9184575

Restek's Pinnacle" columns have been optimised for a variety of environmental applications.