Two common analytical problems are: (1) matrix components that interfere with an analyte’s analysis; and (2) an analyte with a concentration that is too small to analyze accurately. We have seen that we can use a separation to solve the first problem. Interestingly, we often can use a separation to solve the second problem as well. For a separation in which we recover the analyte in a new phase, it may be possible to increase the analyte’s concentration. This step in an analytical procedure is known as a **preconcentration**.

An example from the analysis of water samples illustrate how we can simultaneously accomplish a separation and a preconcentration. In the gas chromatographic analysis for organophosphorous pesticides in environmental waters, the analytes in a 1000-mL sample may be separated from their aqueous matrix by a solid-phase extraction using 15 mL of ethyl acetate.\(^{21}\) After the extraction, the analytes in the ethyl acetate have a concentration that is 67 times greater than that in the original sample (assuming the extraction is 100% efficient).

\[
\frac{1000 \text{ mL}}{15 \text{ mL}} \approx 67 \times
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