

TABLE 3.3 Methods of Covalent Binding of Enzymes to Supports

Supports with —OH	
(a) Using cyanogen bromide	
$ \begin{array}{c} \text{HC—OH} \\ \\ \text{HC—OH} \end{array} + \text{CNBr} \rightarrow \rightarrow \begin{array}{c} \text{HC—O} \quad \text{C=NH} \\ \quad \quad \\ \text{HC—O} \end{array} \xrightarrow{+\text{protein—NH}_2} \begin{array}{c} \text{HC—O—CO—NH—PROTEIN} \\ \\ \text{HC—OH} \end{array} $	
(b) Using S-triazine derivatives	
$ \begin{array}{c} \text{—OH} + \text{Cl} \quad \text{N} \quad \text{Cl} \\ \quad \quad \quad \quad \\ \text{N} \quad \quad \text{N} \quad \quad \text{N} \\ \backslash \quad / \quad \backslash \quad / \quad \backslash \quad / \\ \text{C} \quad \text{C} \quad \text{C} \\ / \quad \backslash \quad / \quad \backslash \quad / \quad \backslash \quad / \\ \text{N} \quad \text{N} \quad \text{N} \quad \text{N} \quad \text{N} \quad \text{N} \\ \quad \quad \quad \quad \quad \\ \text{R} \quad \text{R} \quad \text{R} \quad \text{R} \quad \text{R} \quad \text{R} \end{array} \rightarrow \begin{array}{c} \text{—O—} \quad \text{N} \quad \text{Cl} \\ \quad \quad \quad \quad \\ \text{O} \quad \quad \text{N} \quad \quad \text{N} \\ \backslash \quad / \quad \backslash \quad / \quad \backslash \quad / \\ \text{C} \quad \text{C} \quad \text{C} \\ / \quad \backslash \quad / \quad \backslash \quad / \quad \backslash \quad / \\ \text{N} \quad \text{N} \quad \text{N} \quad \text{N} \quad \text{N} \quad \text{N} \\ \quad \quad \quad \quad \quad \\ \text{R} \quad \text{R} \quad \text{R} \quad \text{R} \quad \text{R} \quad \text{R} \end{array} + \text{PROTEIN—NH}_2 \rightarrow \begin{array}{c} \text{—O—} \quad \text{N} \quad \text{NH—PROTEIN} \\ \quad \quad \quad \quad \\ \text{O} \quad \quad \text{N} \quad \quad \text{N} \\ \backslash \quad / \quad \backslash \quad / \quad \backslash \quad / \\ \text{C} \quad \text{C} \quad \text{C} \\ / \quad \backslash \quad / \quad \backslash \quad / \quad \backslash \quad / \\ \text{N} \quad \text{N} \quad \text{N} \quad \text{N} \quad \text{N} \quad \text{N} \\ \quad \quad \quad \quad \quad \\ \text{R} \quad \text{R} \quad \text{R} \quad \text{R} \quad \text{R} \quad \text{R} \end{array} $	Supports with —NH ₂
(a) By diazotization	
$ \begin{array}{c} \text{—NH}_2 \\ \\ \text{C}_6\text{H}_5 \end{array} \xrightarrow[\text{HCl}]{\text{NaNO}_2} \begin{array}{c} \text{N}_2^+ \text{Cl}^- \\ \\ \text{C}_6\text{H}_5 \end{array} + \text{PROTEIN} \rightarrow \begin{array}{c} \text{N=N} \\ \\ \text{C}_6\text{H}_5 \end{array} \text{—PROTEIN} $	
(b) Using glutaraldehyde	
$ \begin{array}{c} \text{—NH}_2 + \text{HCO—(CH}_2\text{)}_3\text{—HCO} \rightarrow \begin{array}{c} \text{H} \\ \\ \text{—N=C—(CH}_2\text{)}_3\text{—HCO} \end{array} \xrightarrow{+\text{protein—NH}_2} \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{—N=C—(CH}_2\text{)}_3\text{—C=N—} \\ \quad \quad \quad \\ \quad \quad \quad \text{PROTEIN} \end{array} \end{array} $	(continued)