1. Experimental

1.1. Neutralization of the remaining reactive glutaraldehyde (GA) moieties

A 0.2 M glycine solution was prepared in 0.1 M citrate-phosphate buffer pH 4.6. One gram of the β-D-galactosidase (β-gal) loaded agar-Car disks was stirred with this glycine solution for 4 h on a roller stirrer. Afterwards, the disks were thoroughly washed with distilled water, and their observed activities were assayed as in section 2.5.1.

2. Results and discussion

2.1. Neutralization of the remaining reactive GA moieties

The remaining reactive GA moieties in the enzyme loaded agar-Car disks were neutralized after reacting with glycine. The low molecular weight of glycine (75 Da) would enable it to reach such remaining reactive GA moieties, which would be shielded by the β-gal molecules. Chen and Roberts reported that employing glycine at a molar ratio of 0.4 glycine-1 GA for 30 min would neutralize the hazardous effect of GA. In the case in hand, the concentration of the reactive GA moieties that remained after washing the disks from the residuals of the 5% (0.5 M) GA solution and after the covalent immobilization of β-gal would definitely be too small. Thus, a 0.2 M glycine solution would be capable of providing an even bigger glycine-GA ratio than the one reported by Chen and Roberts. The enzyme loaded agar-Car disks were soaked in this 0.2 M glycine solution for 4 h. In order to ascertain that such a glycine treatment did not exert a negative effect on the β-gal, the observed activity of the glycine treated disks was assayed and compared to the observed activity of the glycine untreated disks. The results showed that there was no significant difference between the two samples (P value=0.66). The glycine did not inactivate the β-gal; hence, it could be employed to neutralize any remaining reactive GA moieties.