Fig. 1s Schematic representation of reaction formula of PVA with $\text{H}_3\text{BO}_3$

Fig. 2s Schematic representation of reaction formula of PVA/glycerol with $\text{H}_3\text{BO}_3$
Fig. 3s The image of the PVA/1.5 wt % glycerol hydrogel beads before aeration (a), PVA/1.5 wt % glycerol hydrogel beads after aeration for 22 months (b), PVA/1.5 wt % glycerol hydrogel beads immobilized with microorganism before aeration (c) and PVA/1.5 wt % glycerol hydrogel beads immobilized with microorganism after aeration for 11 months (d)