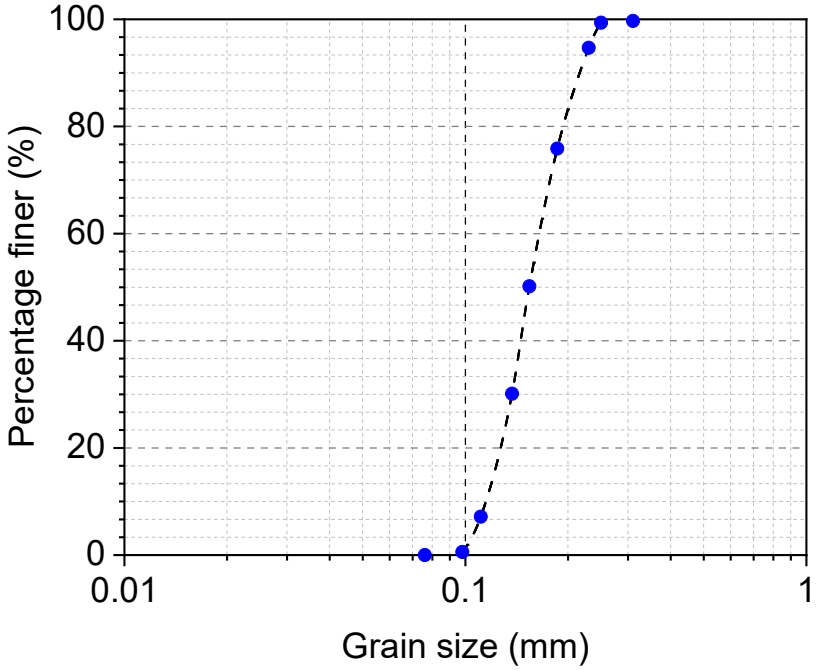


Figure 1 Particle size distribution of the sand used in this study

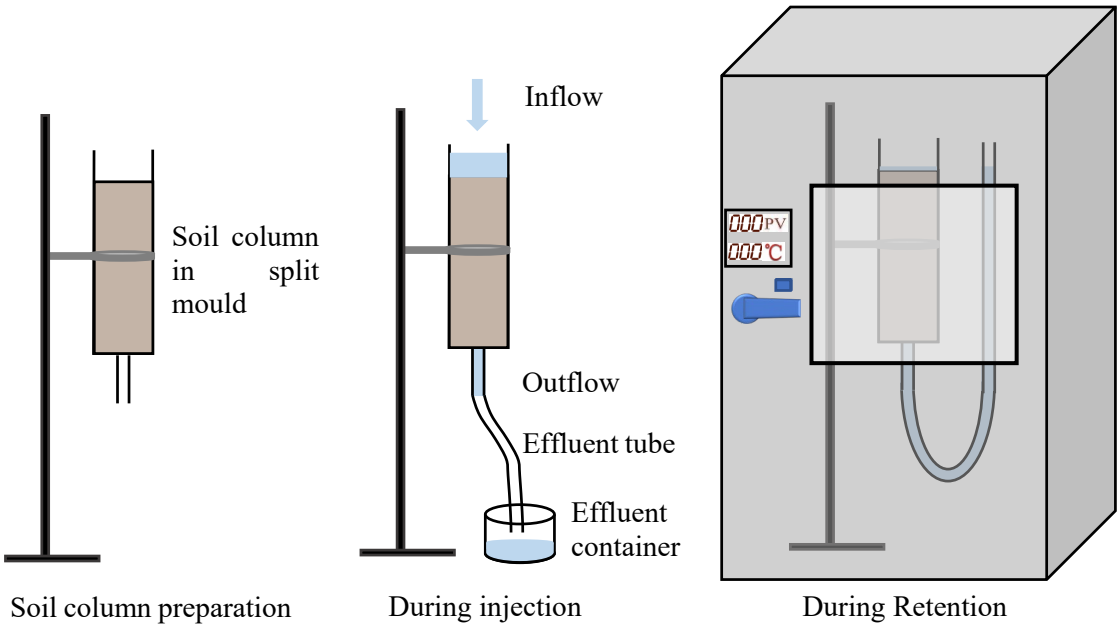


Figure 2 Schematic of the soil column experiments

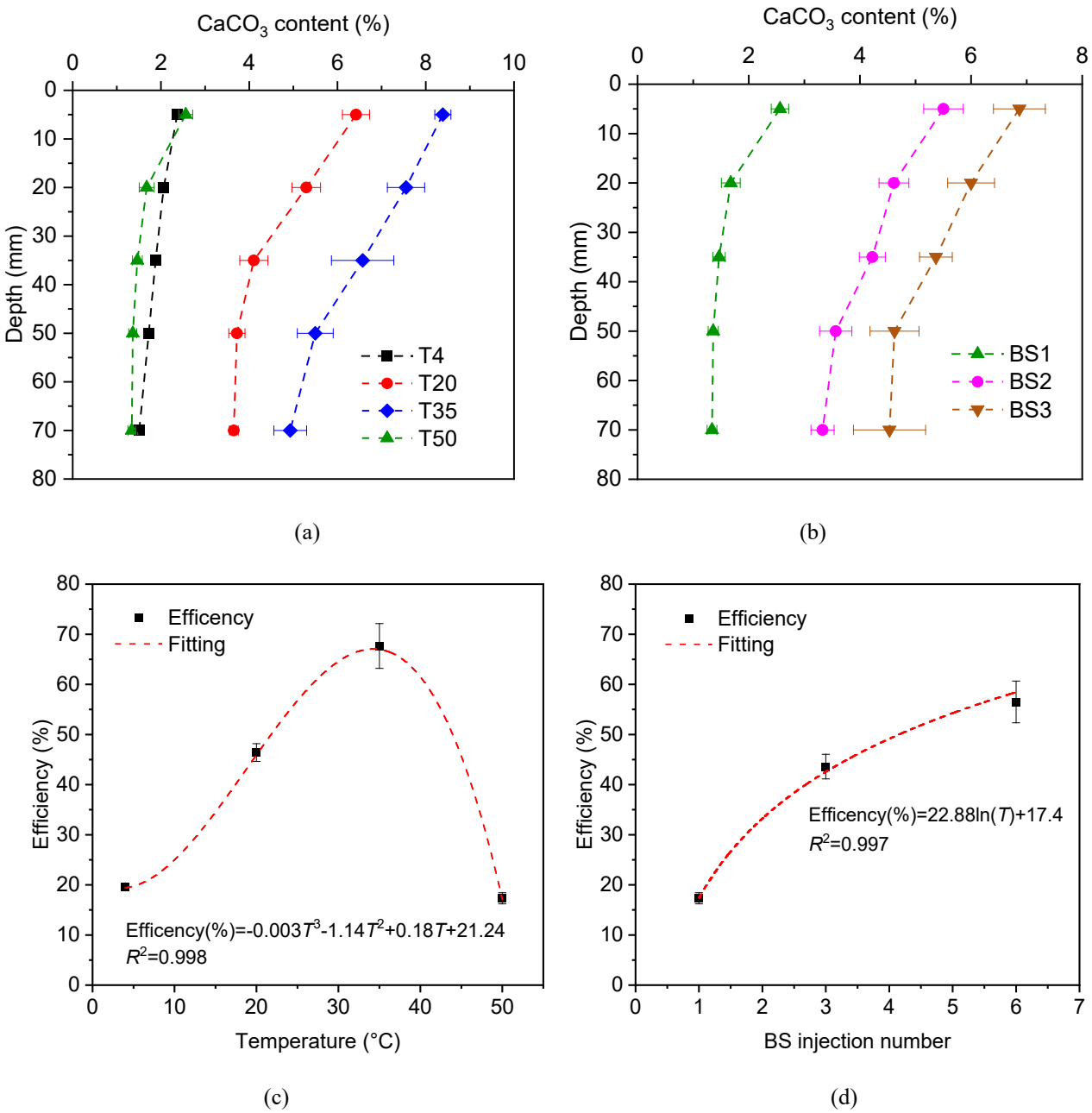


Figure 3 $CaCO_3$ distribution along sand columns and chemical transform efficiency of MICP: (a, c) specimens treated at different temperatures with bacteria introduced only once; (b, d) specimens treated at 50°C with bacteria introduced once, twice, and three times, respectively

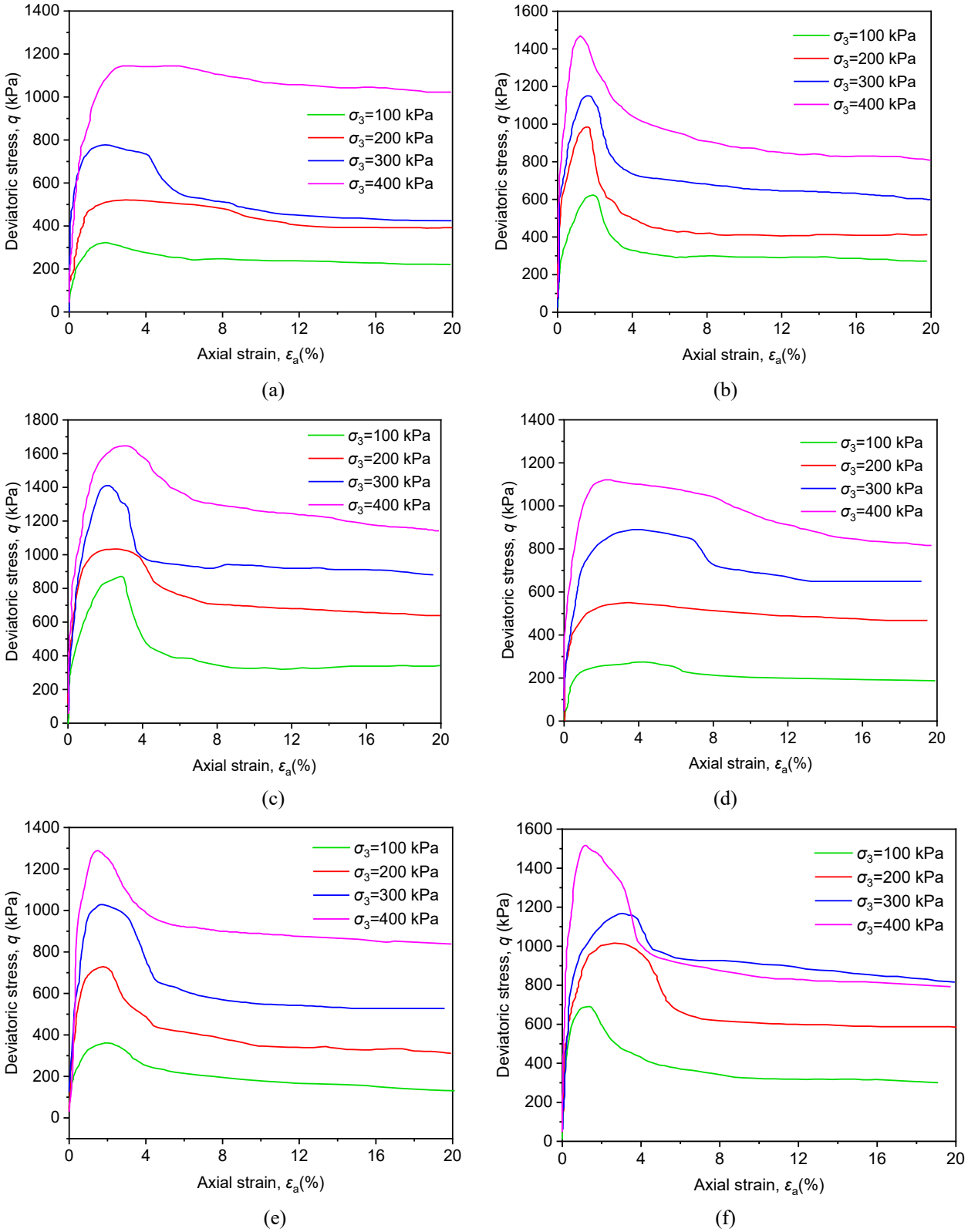


Figure 4 Stress-strain behaviour for the specimen treated at: (a) T=4℃; (b) T=20℃; (c) T=35℃; (d) T=50℃ (BS1); (e) T=50℃ (BS3); (f) T=50℃ (BS6)

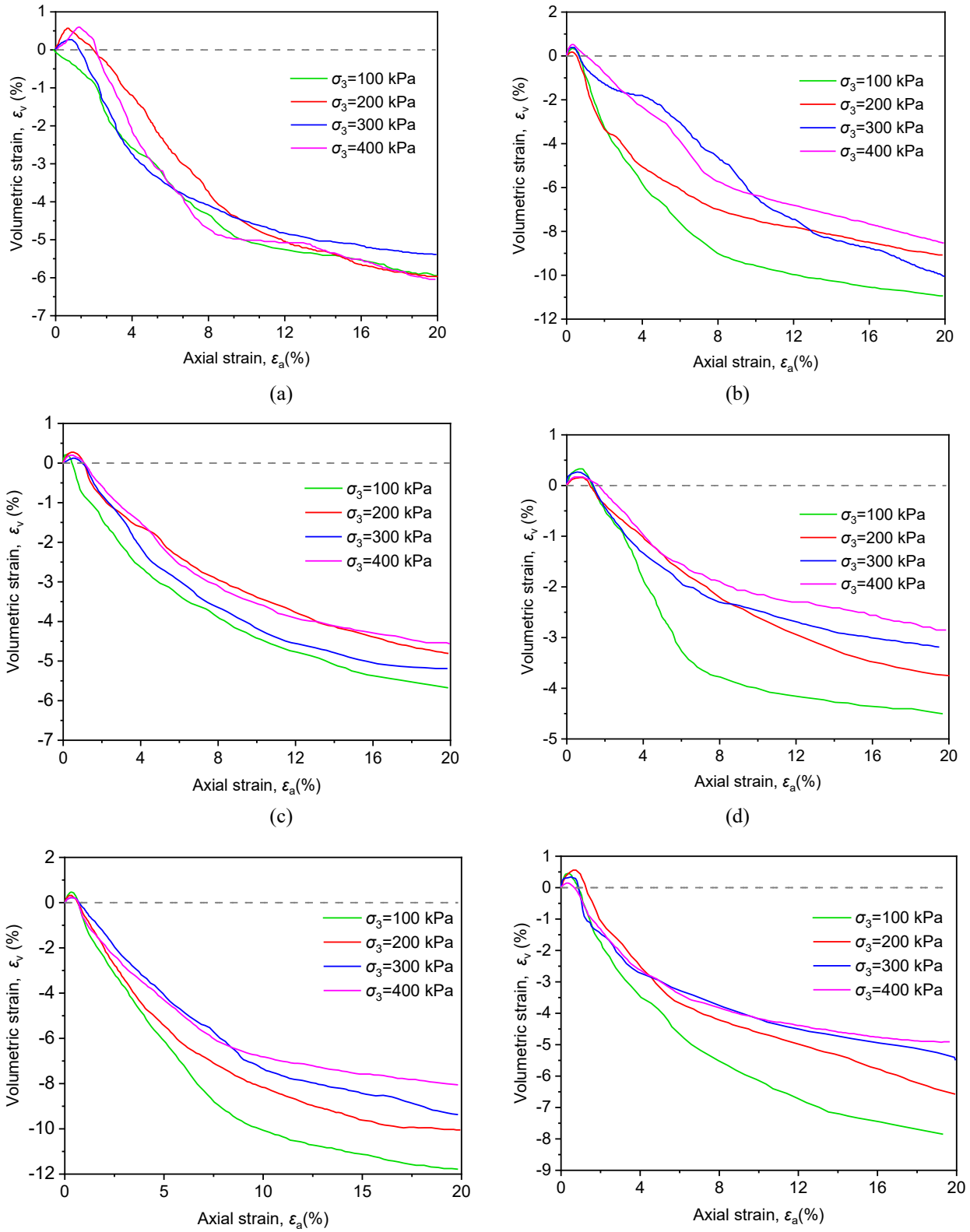


Figure 5 Relationship between axial strain and volumetric strain: (a) T=4℃; (b) T=20℃; (c) T=35℃; (d) T=50℃ (BS1); (e) T=50℃ (BS3); (f) T=50℃ (BS6)

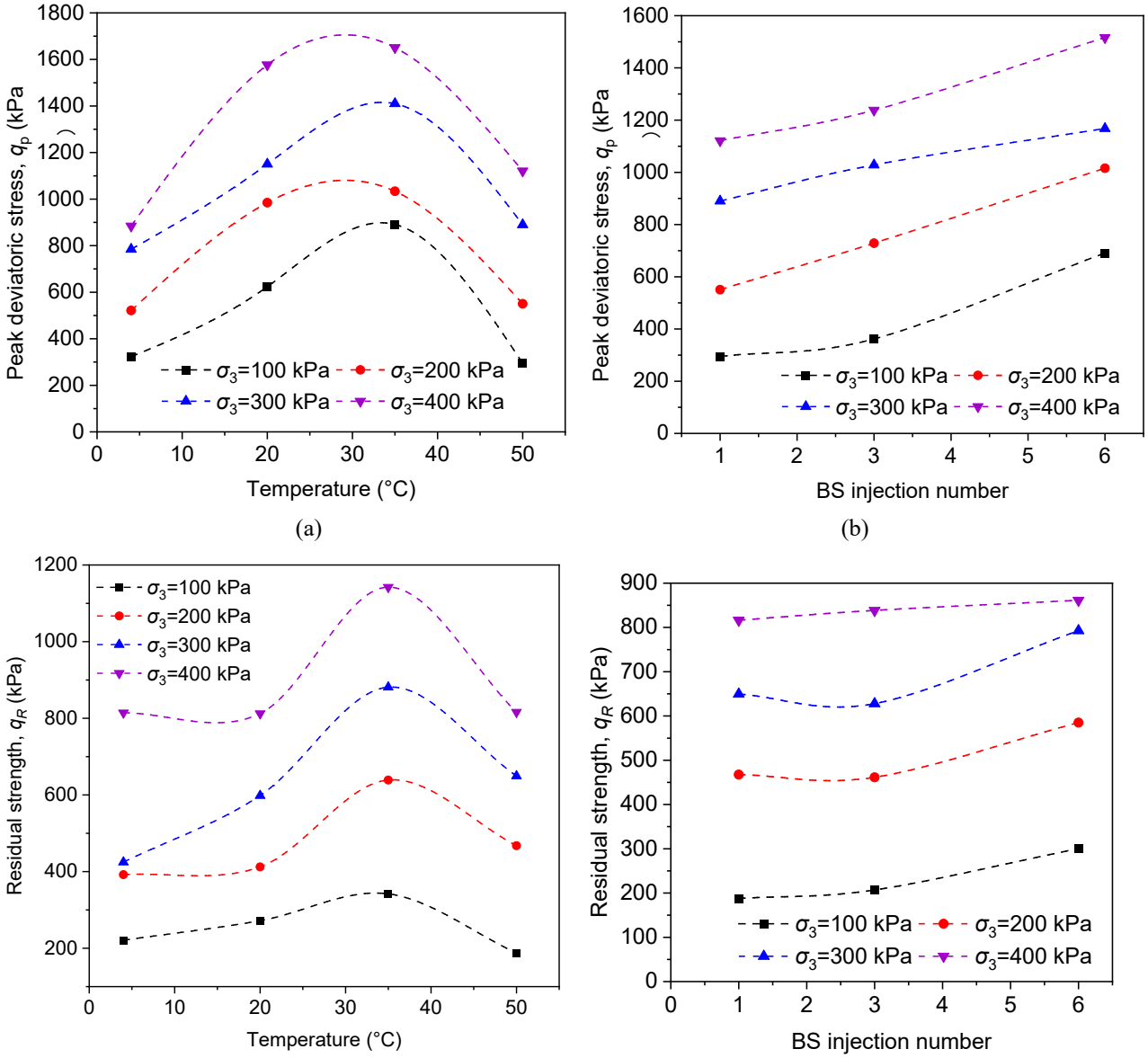
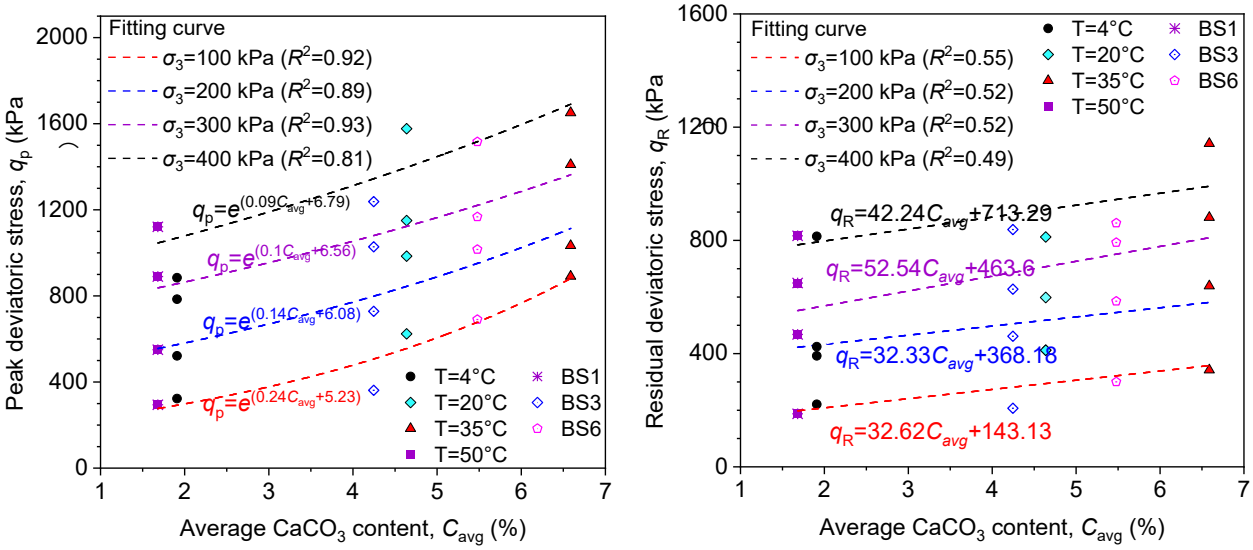


Figure 6 Measured and fitted relationship of q_p-T-σ_3 and q_R-T-σ_3: (a, c) specimens treated at different temperatures with bacteria introduced only once; (b, d) specimens treated at 50℃ with bacteria introduced once, twice, and three times, respectively



(a) (b)

Figure 7 Relationships between peak (a) and residual deviatoric stress (b) with average $CaCO_3$ content

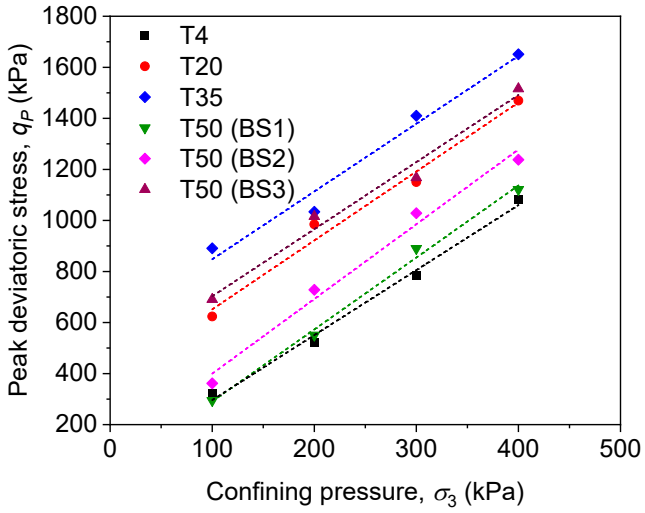


Figure 8 Relationship between peak deviatoric stress and confining pressure

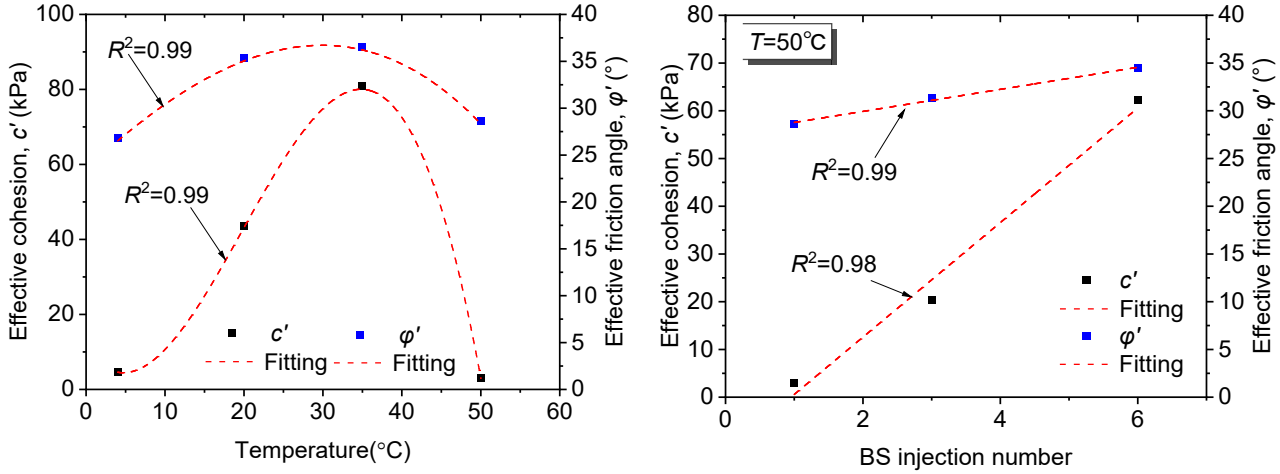
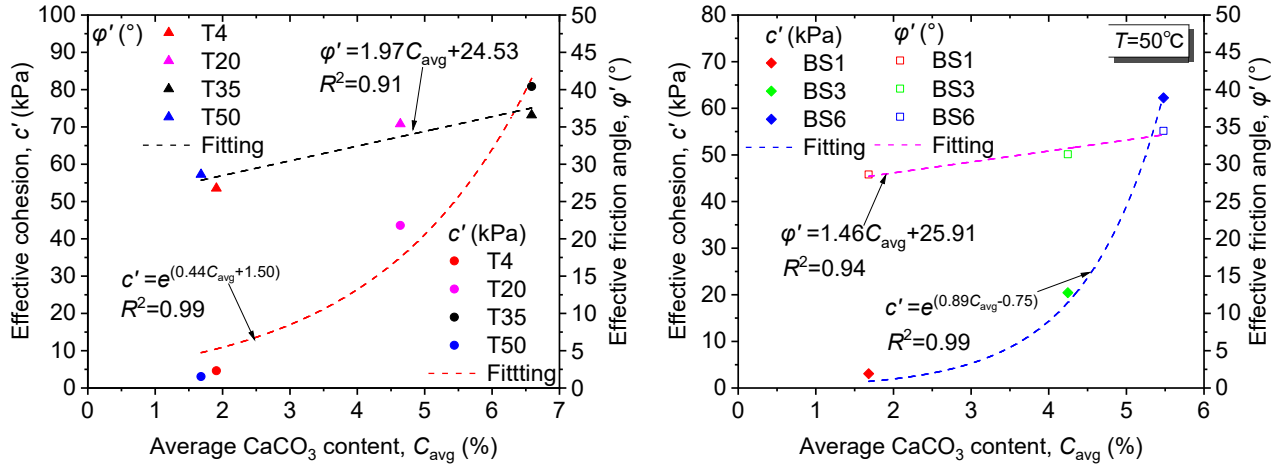
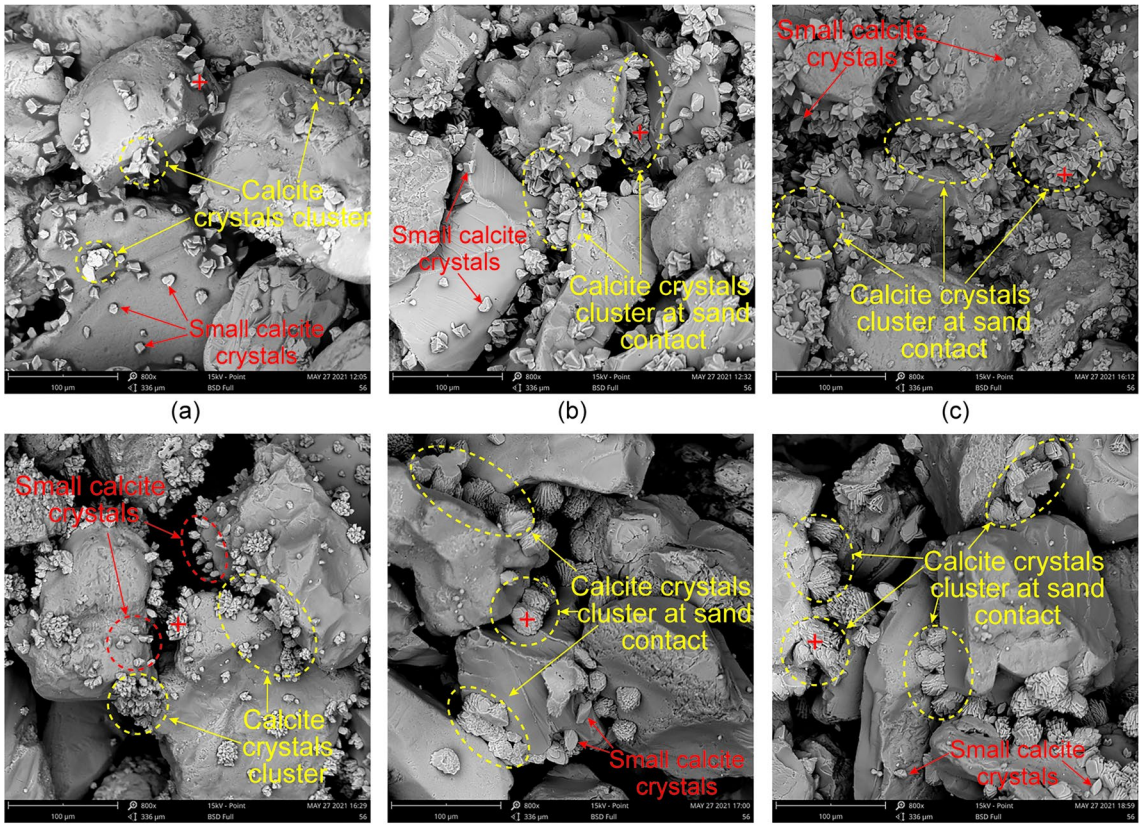


Figure 9 Relationship between strength parameters and average $CaCO_3$ content at: (a) different temperature; (b) different BS injection number at 50°C



(a) (b)

Figure 10 Effects of average $CaCO_3$ content on effective cohesion and friction angle



159

160 **Figure 11** SEM images of specimens treated at different temperature and conditions: (a) T=4℃ (BS1); (b) T=20℃ (BS1);

161 (c) T=35℃ (BS1); (d) T=50℃ (BS1); (e) T=50℃ (BS3); (f) T=50℃ (BS6)

162

163

164

165

166

167

168

169

170

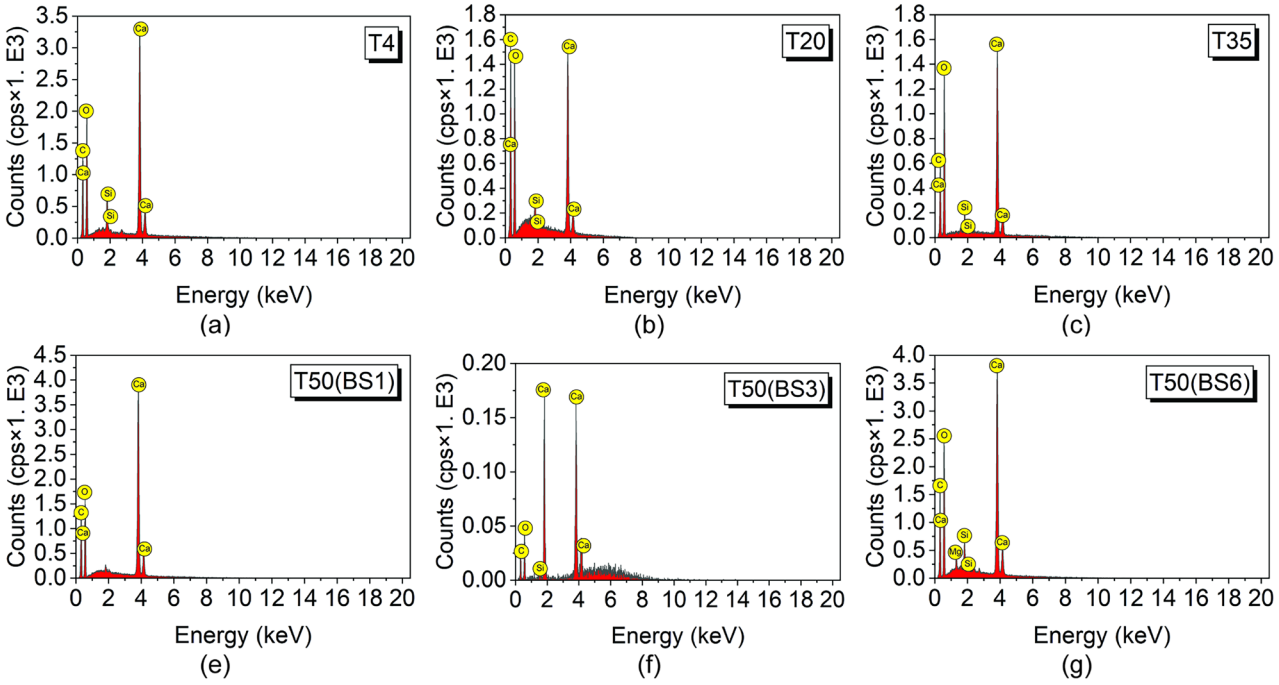
171

172

173

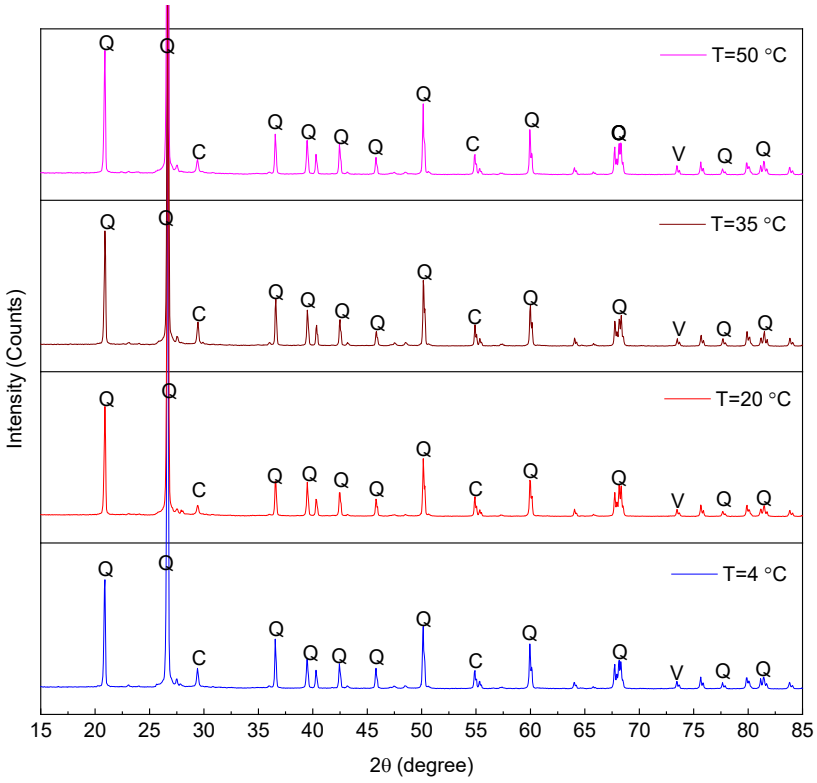
174

175



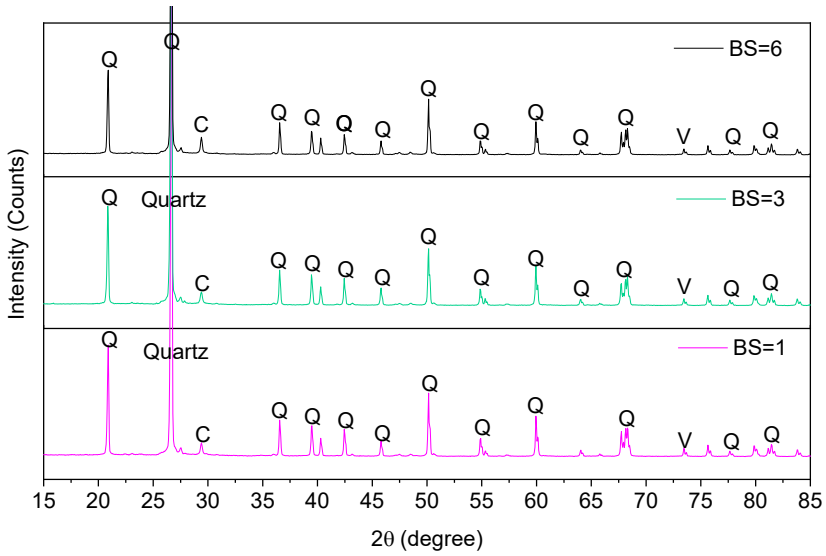
176

177 (a)



178

179 (b)



(c)

Figure 12 (a) EDS spectrum of specimens treated at different temperature; (b and c) The XRD results of biocemented sand at different temperatures: Q indicates Quartz, Ca indicates calcite.