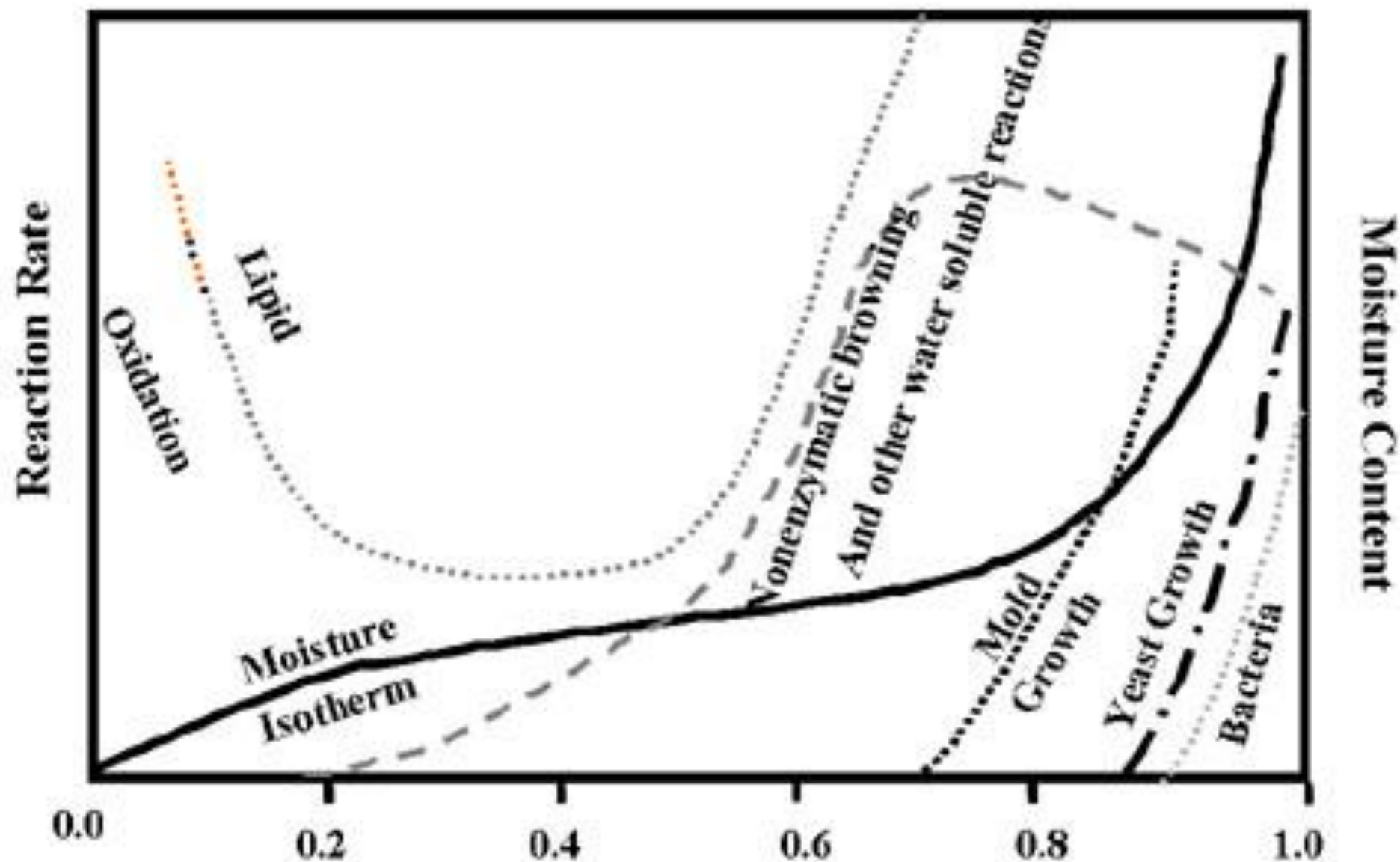


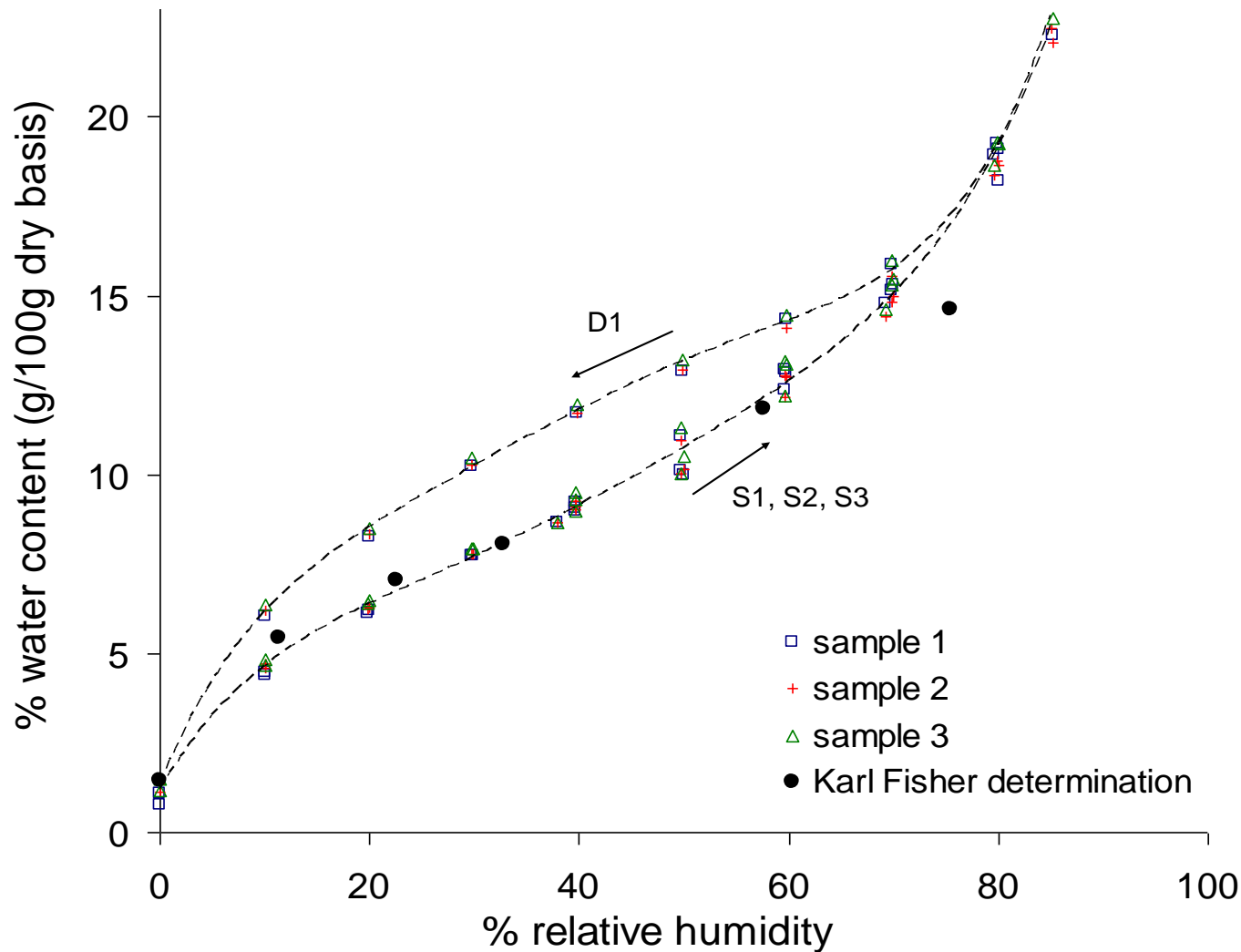
Water in food, equilibria versus dynamics.

- P.Lillford, D.Champion and Y.Huang

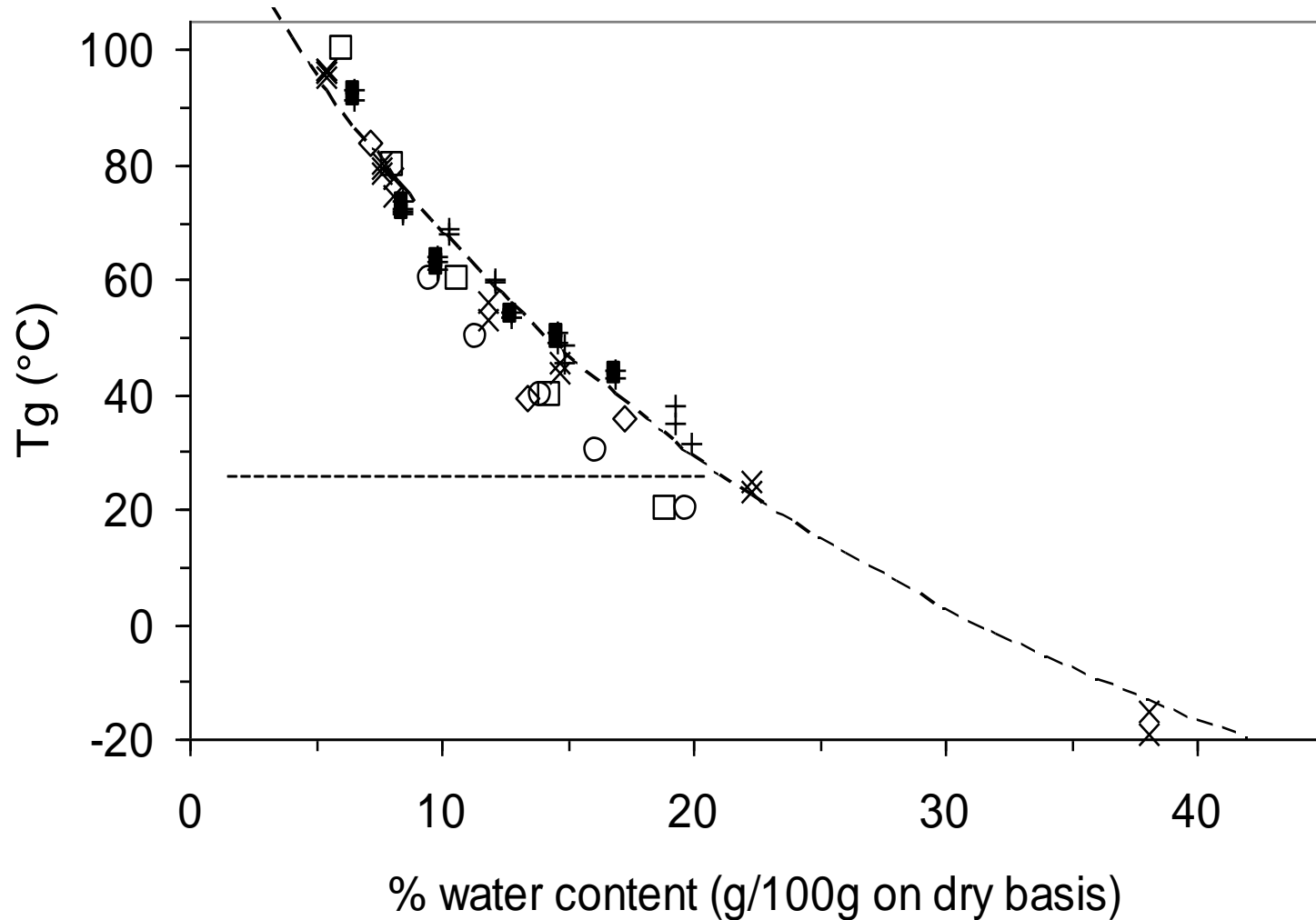
Problem 1: Hysteresis
in
Sorptions/Desorption



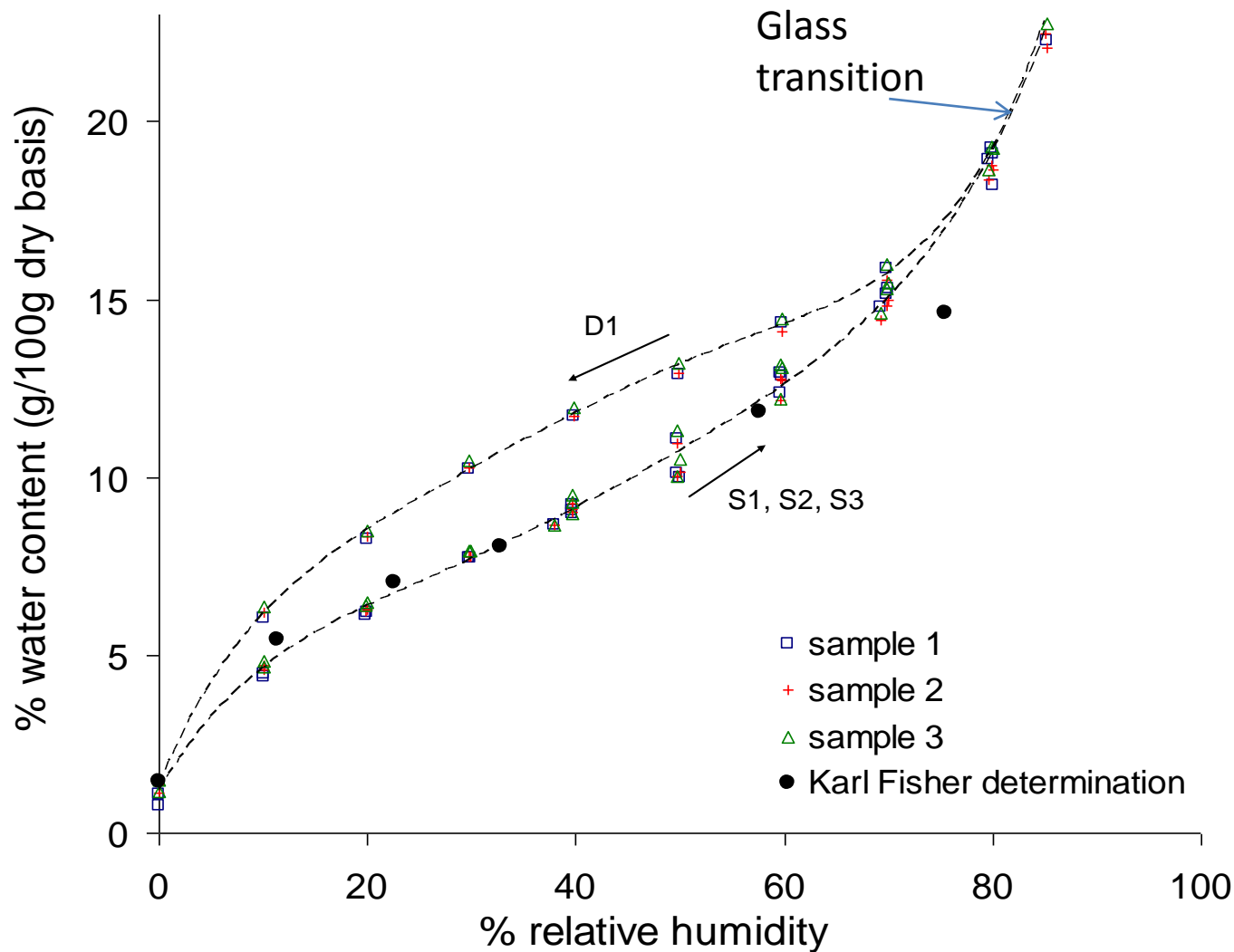
Adsorption/desorption of gluten



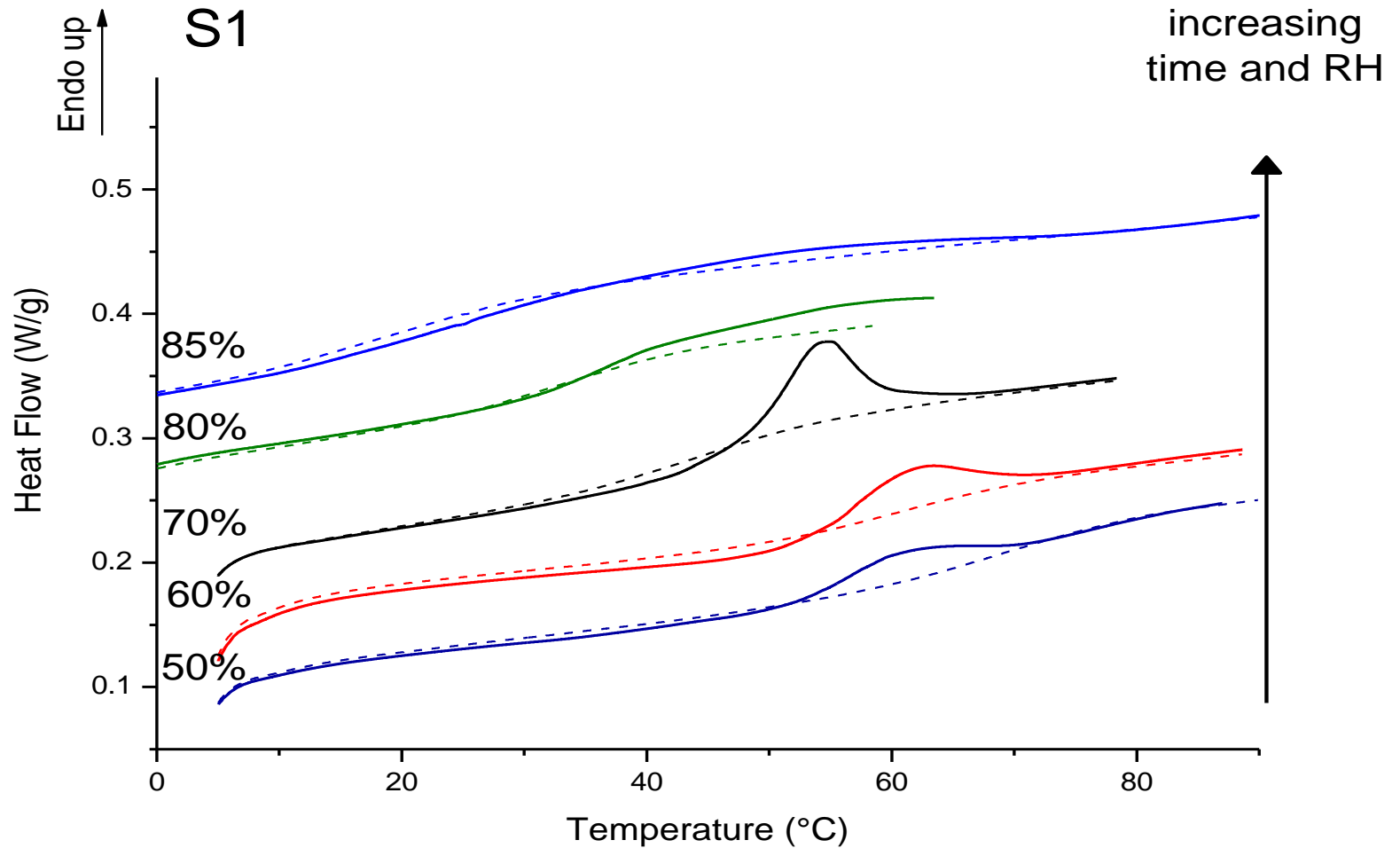
Gluten Glass transition (2nd scan DSC)



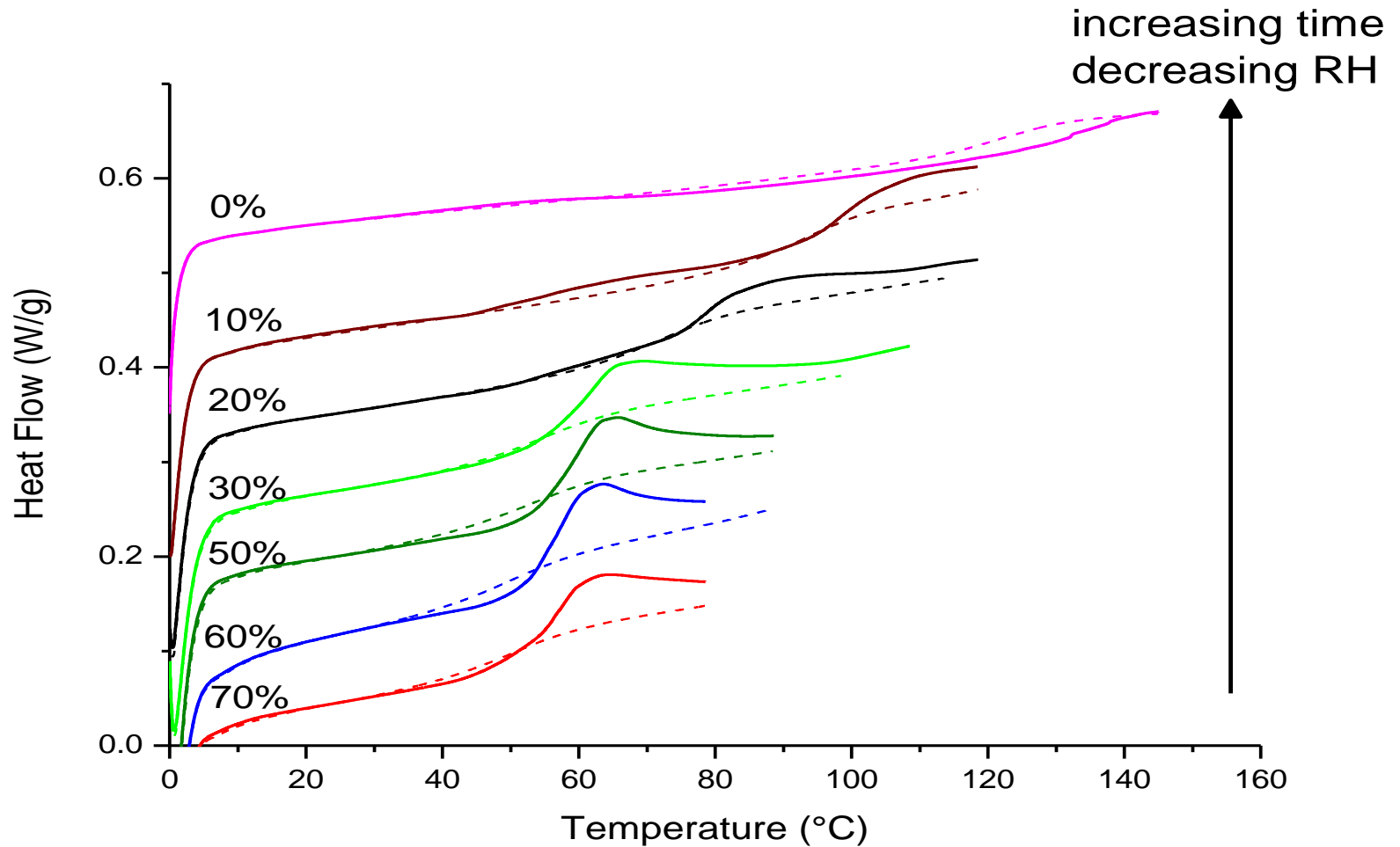
Adsorption/desorption of gluten



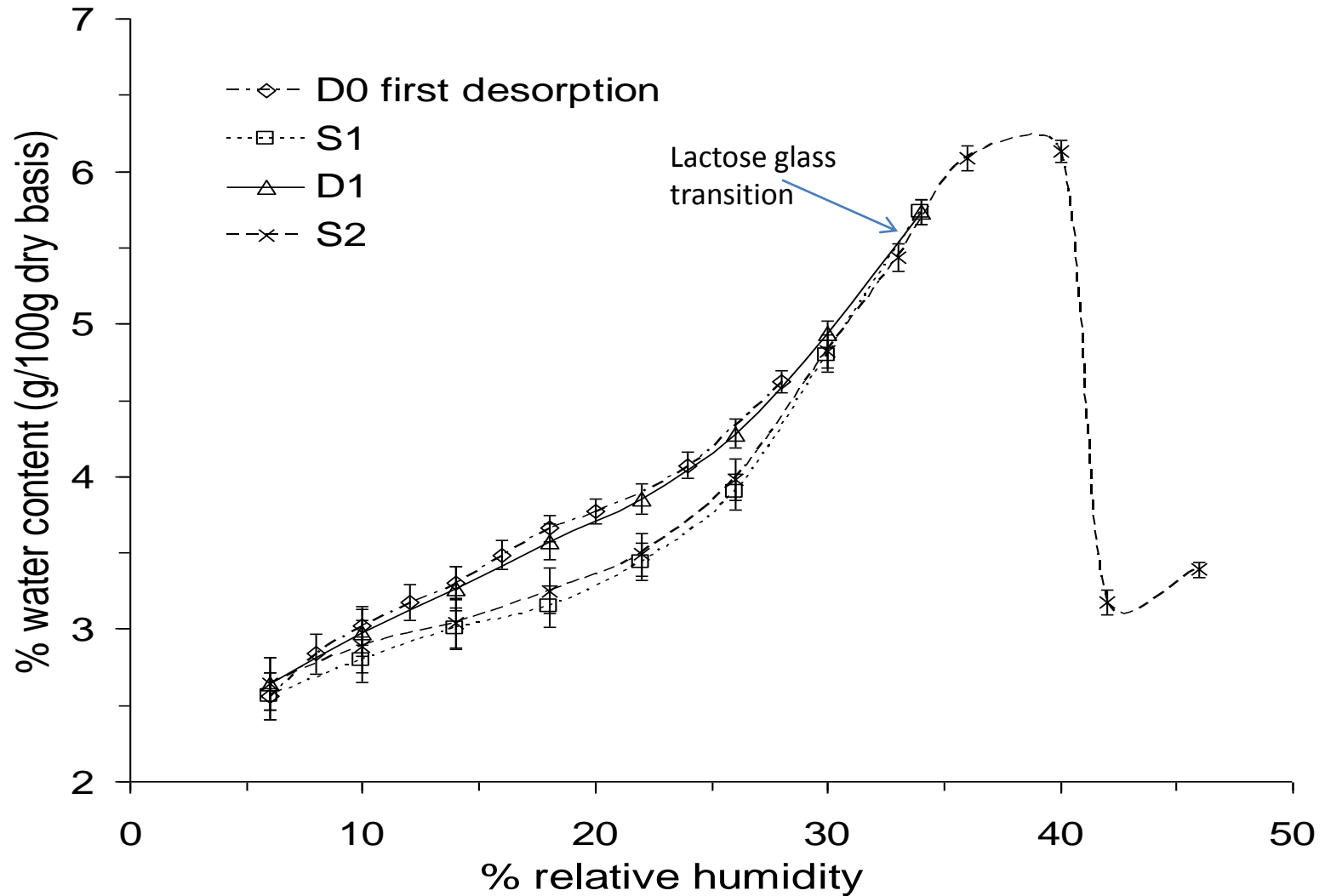
DSC adsorption cycle



DSC-desorption cycle

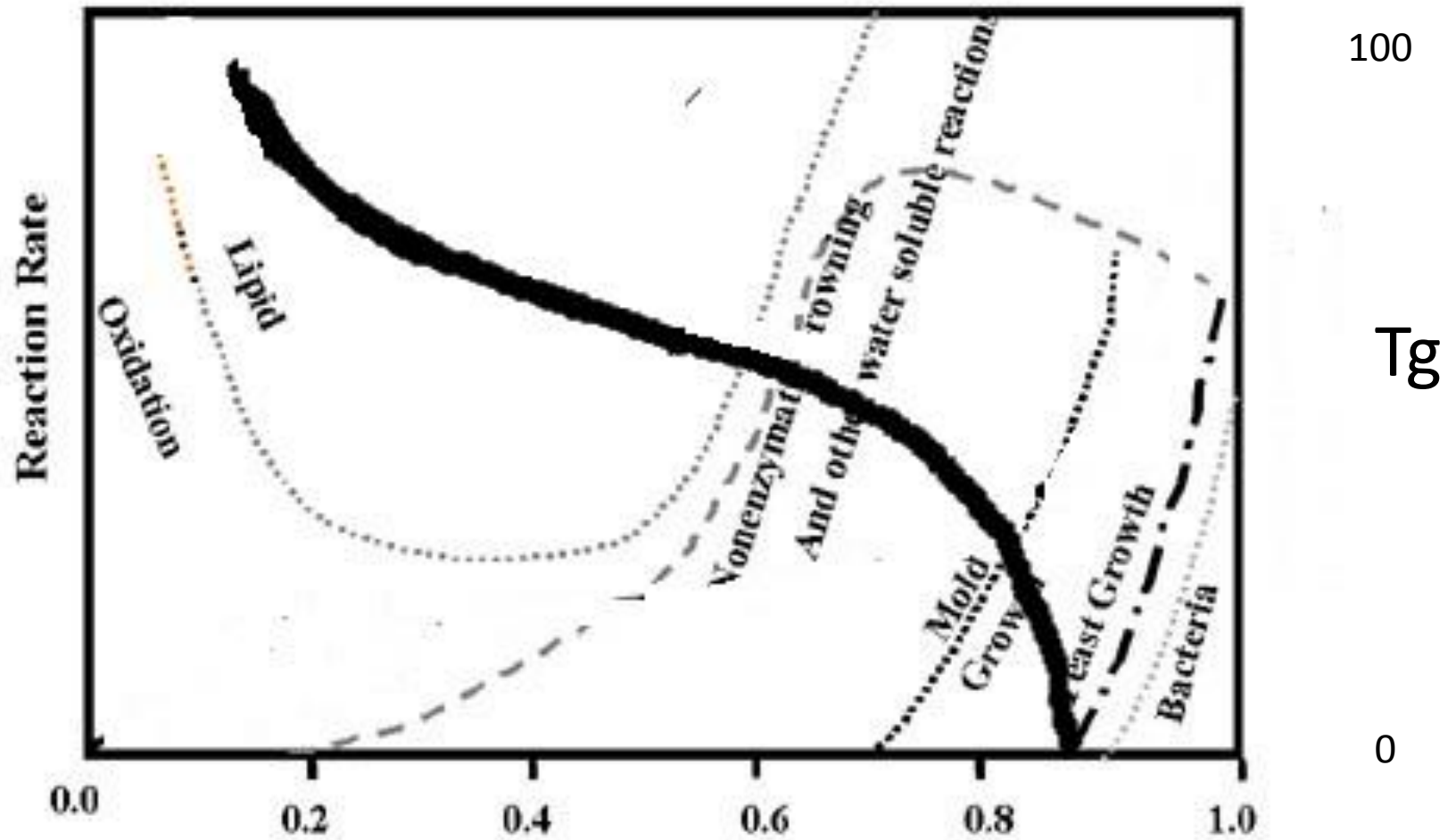


Adsorption/desorption of yoghurt powder



Problem 2; Mobility inhibits growth
(but mobility of what?)

Water Activity and Glass transitions

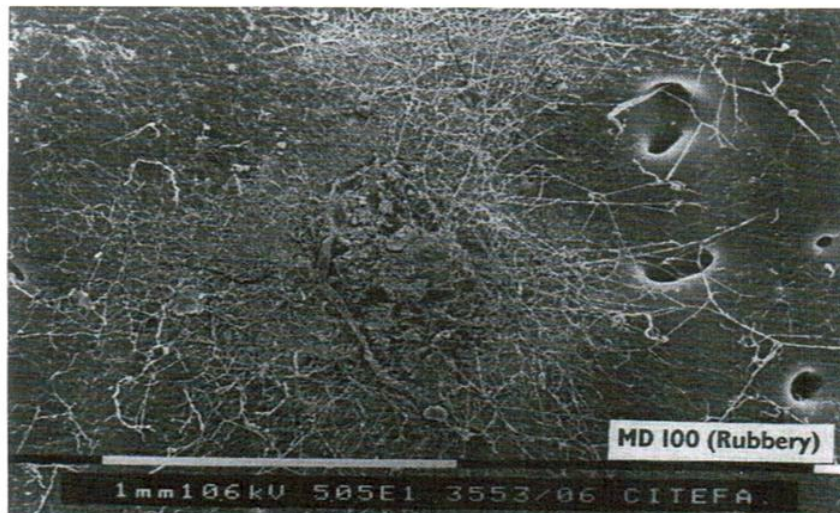


Mould growth on glassy and rubbery matrices

E.Chevalieri-after 40 days (Chirife, Buera and Gonzales-1999)

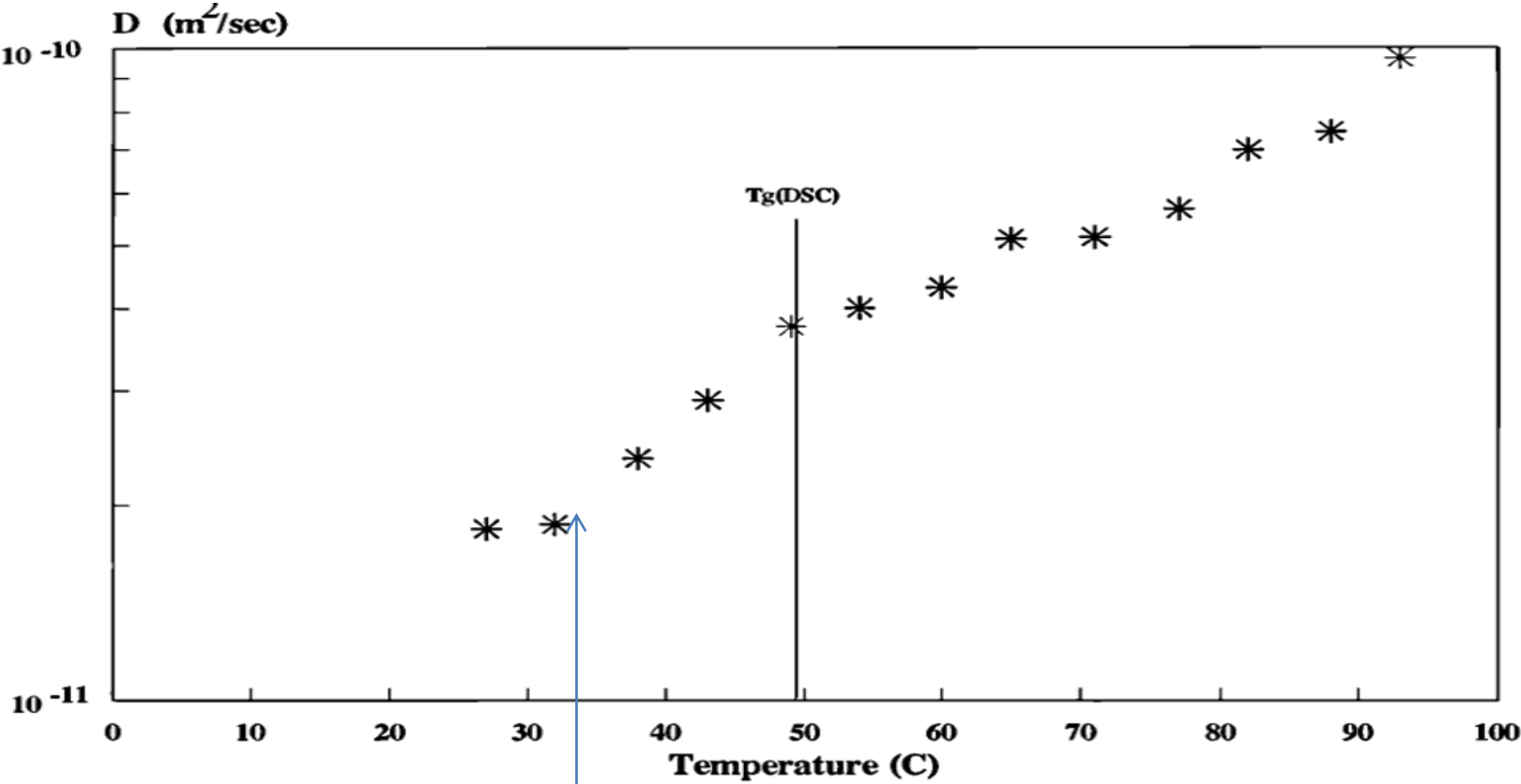


$T_g = 43^\circ\text{C}$
 $T - T_g = -17$



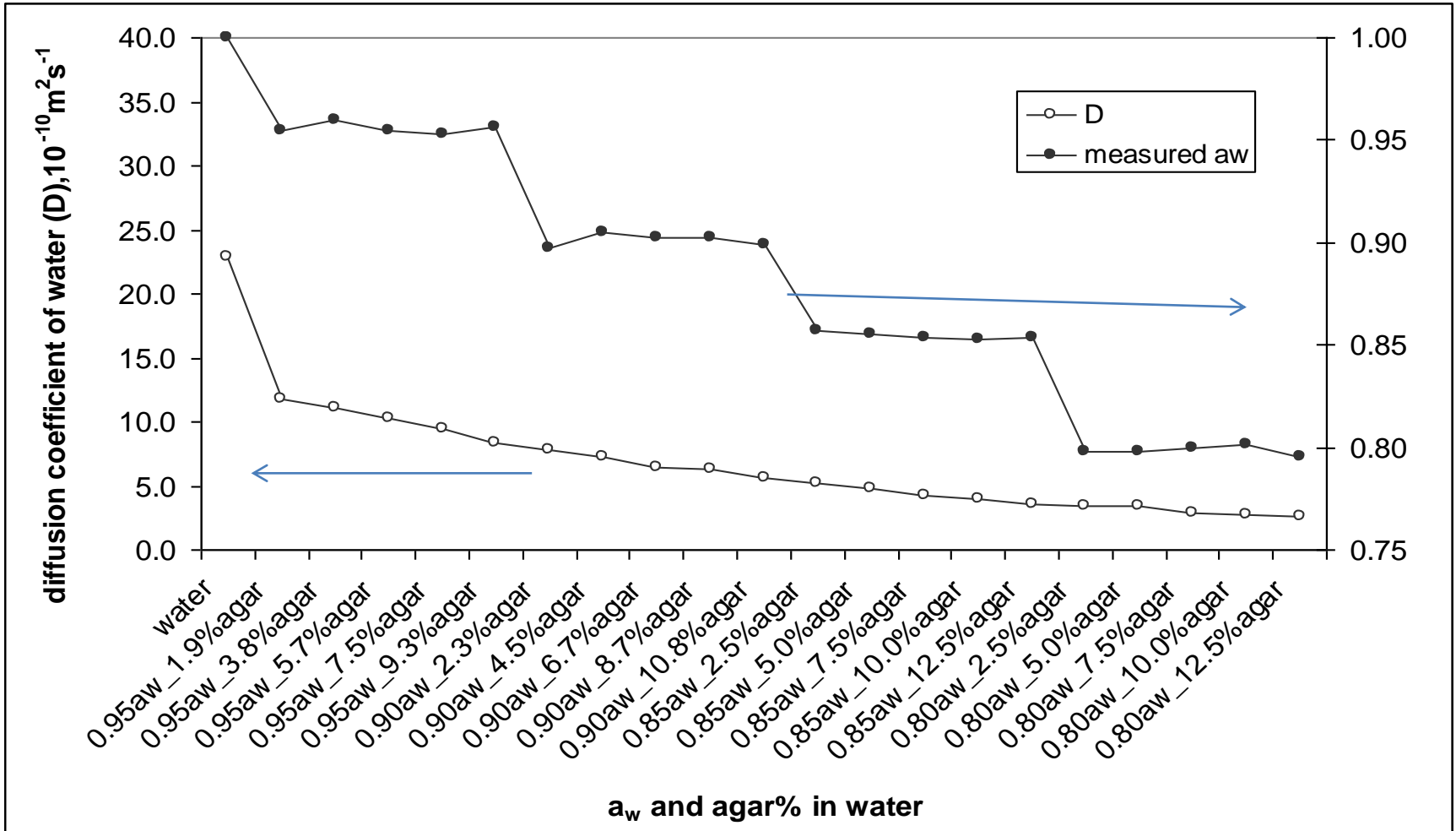
$T - T_g = +14$

Diffusion of Water in Pullulan at the glass transition



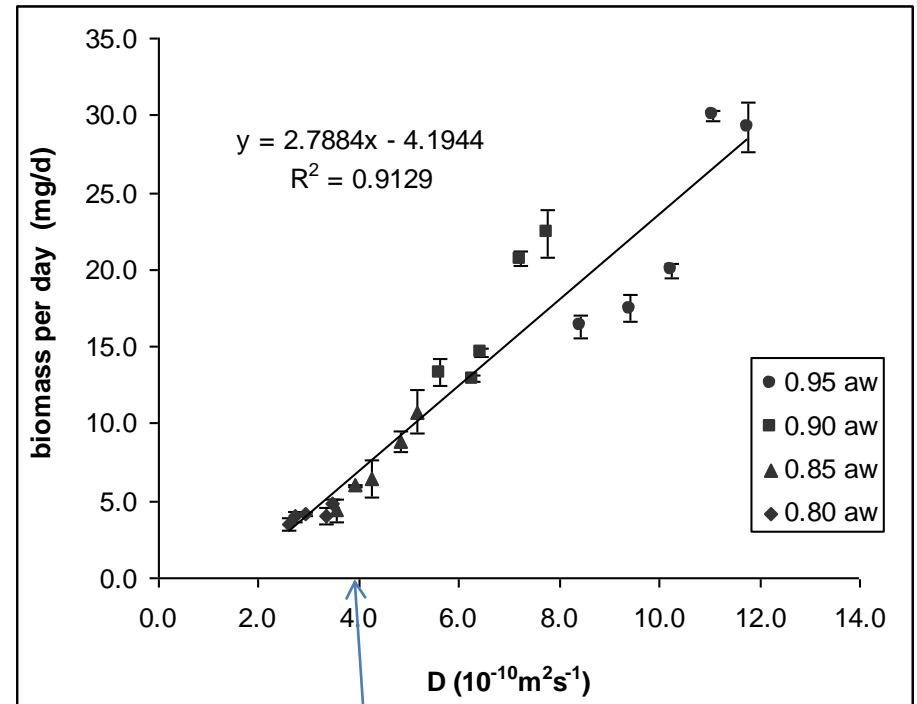
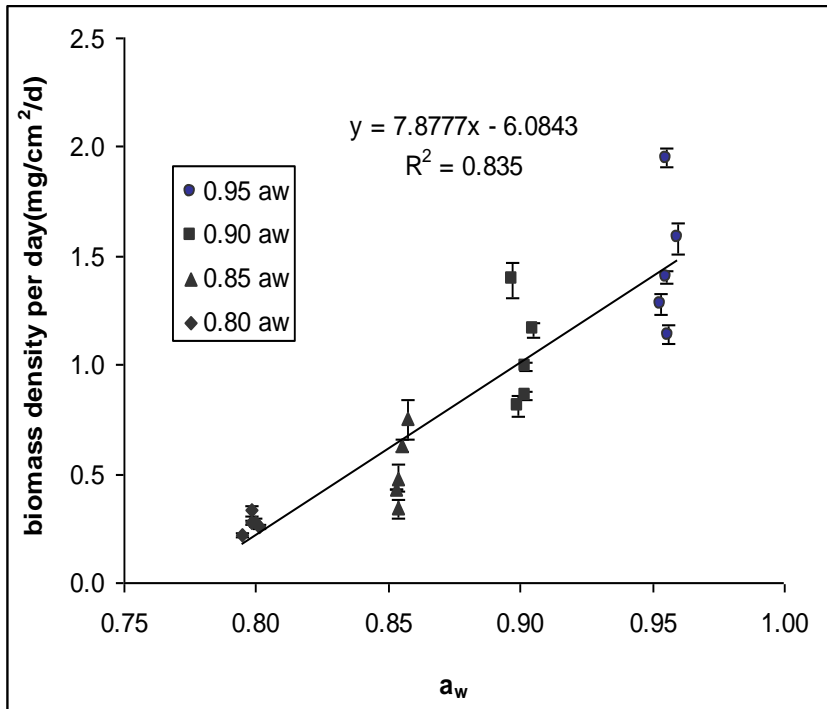
Diffusion distance = 1.3mm/day at $T - T_g = -17$

Diffusion of water in gelled growth media



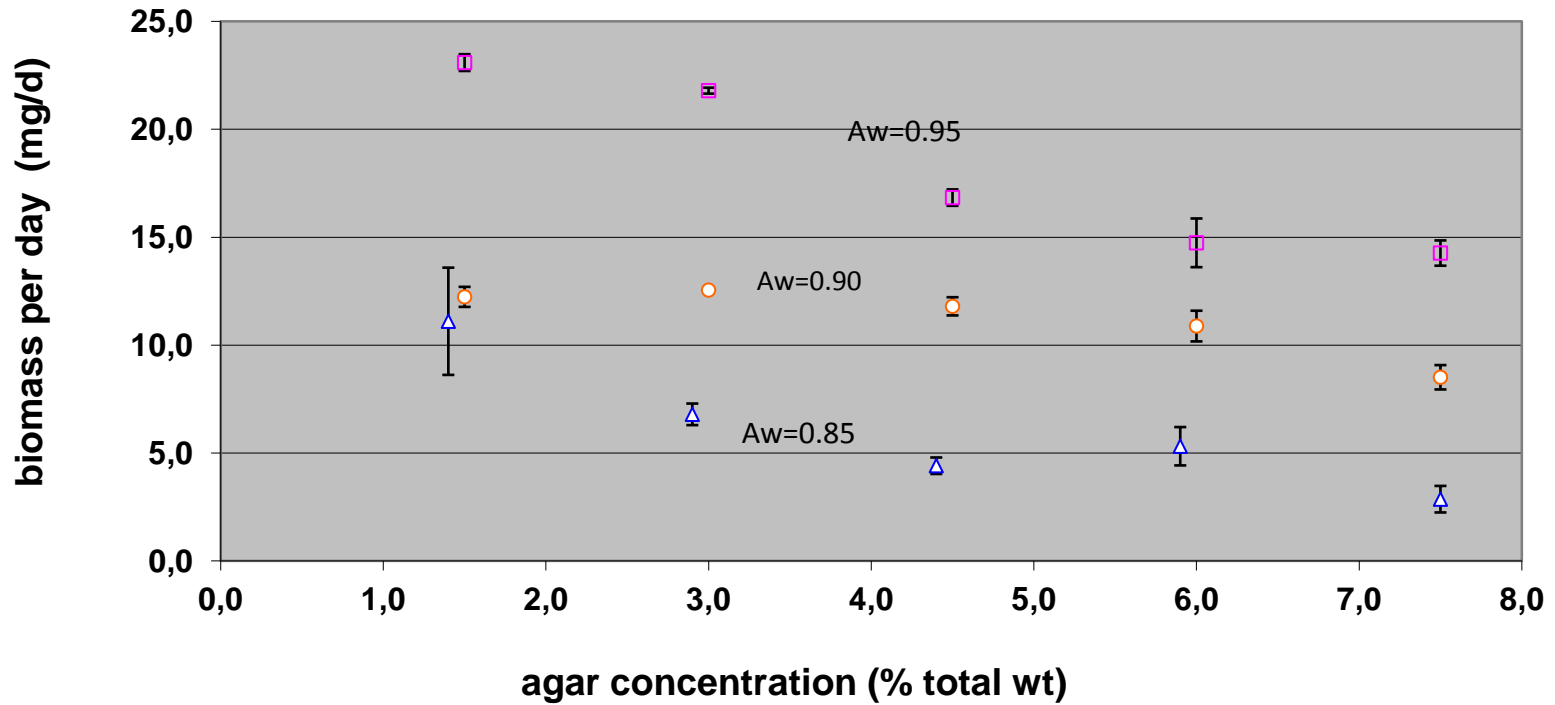
Growth of *E. herbariorum* in agar gels

Aw 0.8-0.95



Growth of A.Niger in agar gels

Aspergillus niger on Dichloran/glycerol/agar medium



Growth Rate vs Water Diffusion

