A simple quantitative model for the reversible association of DNA coated colloids REMI DREYFUS, MIRJAM LEUNISSEN, ROUJIE SHAH, New York University, ALEXEI TKACHENKO, University of Michigan, NADRIAN SEE-MAN, DAVID PINE, PAUL CHAIKIN, New York University — We investigate the reversible association of micrometer-sized colloids coated with complementary single-stranded DNA ‘sticky ends’ as a function of the temperature and the sticky end coverage. We find that even a qualitative description of the dissociation transition curves requires the inclusion of an entropic cost. We develop a simple general model for this cost in terms of the configurational entropy loss due to binding and confinement of the tethered DNA between neighboring particles. With this easy-to-use model, we demonstrate for different kinds of DNA constructs quantitative control over the dissociation temperature and the sharpness of the dissociation curve, both essential properties for complex self-assembly processes.