

Gravimetric Studies of Molecular Recognitions

Yoshio Okahata
Tokyo Institute of Technology

In this paper, we introduce a 27-MHz quartz-crystal microbalance (QCM) as a new tool to detect biomolecular interactions in an aqueous buffer solution. From the time course of the frequency decrease (mass increase), the binding amount (Δm), association constant (K_a), binding and dissociation rate constant (k_1 and k_{-1}) can be obtained. When dsDNA was immobilized on a QCM, binding kinetics of antibiotics, a Zinc-finger type peptide, a restriction enzyme, and a polymerase to DNA strands could be obtained in aqueous buffer solution. The 27-MHz QCM is highly sensitive and quantitative enough to detect various molecular interactions on DNA double strands. Since the QCM is a mass-measuring device, we can apply it widely to detect various interactions of a biomolecules in vitro.

