Intermediate configurations consist on redistributed arrays of particles, *e.g.* for $N = 10$ particles sort in the following proportions: $1:9, 2:8, 3:7$, and the triangular or hexagonal pattern of such arrays is the determining factor of its frequency of occurrence.

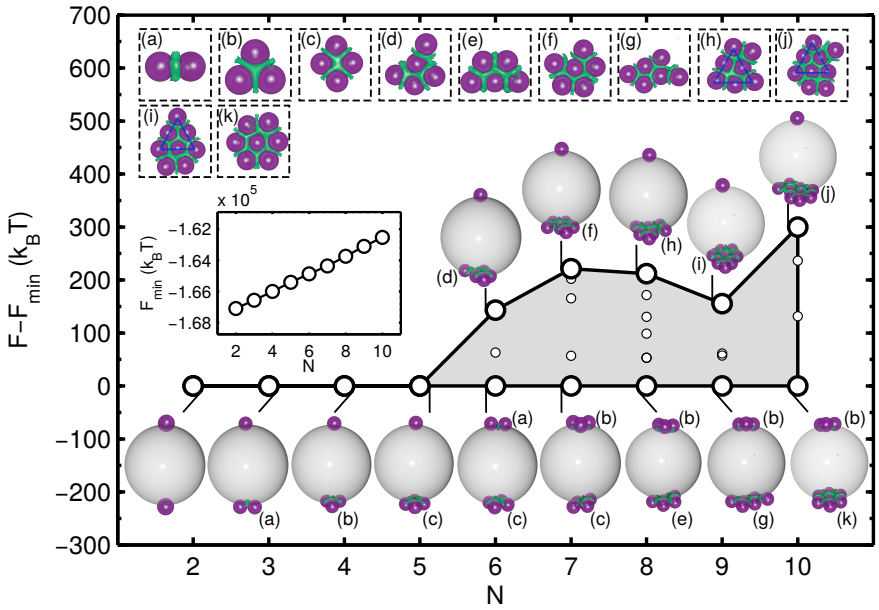

Figure 5.3. Free energy difference for homeotropic particles with infinite anchoring in a planar droplet as a function of the number of particles N, taking as reference the minimum free energy for each N pictured in the insert. Small round markers indicate metastable configurations (not shown), while big markers represent configurations with the maximum and minimum free energy density. Labels (a)-(k) correspond to the inserts and show the specific assembly of nanoparticles.

5.2.2 Planar particles

For particles with planar anchoring we considered strong and moderate anchoring strengths. Strong anchoring conditions, $W = 1 \times 10^{-3}$ J/m^2, narrow the window of possible configurations and only three types of defect structure are observed, as drawn in the inserts (a)-(c) in figure 5.4. Due to the bipolar configuration of the droplet, a planar particle located on the boojum, opposite to the homeotropic particle, generates a half shell defect, as observed in the cases of minimum free energy with $N = 1, 2, 3$ and depicted in insert (a). If the particle is located anywhere else on the surface, the defect does not surround the complete hemisphere that is submerged but instead forms two bands that surround the particle, as in insert (b). In the rare cases where two particles