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Ion Induced Changes in Phosphoinositide Monolayers at Phisiological Concentrations[1] ADOLPHE KAZADI BADIAMBILE, Syracuse University, MARTIN B. FORSTNER, Physic Department, Syracuse University, Syracuse, NY, 13244. Syracuse Biomaterials Institute, Syracuse University, Syracuse, NY 13244 — Phosphoinositides (PIPs) play a crucial role in many cellular process that occur at the plasma membrane such as calcium release, exocytosis or endocytosis. In order to specifically regulate these functions PIPs must segregate in pools at the plasma membrane. A possible mechanism that could induce and regulate such organization of phosphoinositides is their interaction with bivalent cations. Understanding the physicochemical mechanism that can regulate membrane structure is a crucial step in the development of adaptive biomimetic membrane systems. Using Langmuir monolayers, we investigated the effect of calcium and magnesium on the surface pressure-area/lipid isotherm of monolayer of phosphatidylinositol (PI), phosphatidylinositol bisphosphate (PIP2), dioleoylphosphatidylglycerol (DOPG) and palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine (POPC). It is found that the decrease of area per lipid, i.e. the increase in aggregation, is mostly dependent on the lipid's head group charge but ion specific. In addition, we discuss changes in free energy and compressibility of these monolayer-ion systems.

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