Introduction By Sergeev’s definition the nanochemistry is a science field connected with obtaining and studying of physical-chemical properties of particles having sizes of nanometer scale. Let’s note that according to this definition polymers synthesis is automatically a nanochemistry part as far as according to the Melikhov’s classification polymeric macromolecules (more precisely macromolecular coils) belong to nanoparticles and polymeric sols and gels – to nanosystems. Catalysis on nanoparticles is one of the most important sections of nanochemistry. The majority of catalytic systems are nanosystems. At heterogeneous catalysis the active substance is tried to deposit on carrier in nanoparticles form in order to increase their specific surface. At homogeneous catalysis active substance molecules have often in them selves nanometer sizes. The most favourable conditions for homogeneous catalysis are created when reagent molecules are adsorbed rapidly by nanoparticles and are desorbed slowly but have high surface mobility and, consequently, high reaction rate on the surface and at the reaction molecules of such structure are formed at which desorption rate is increased sharply. If these conditions are realized in nanosystem with larger probability than in macrosystem, then nanocatalyst has the raising activity that was observed for many systems. In the connection such questions arise as adsorption and desorption rate, surface mobility of molecules and characteristics frequency of reagents interaction acts depend on the size, molecular relief and composition of nanoparticles and the carrier. The presence paper purpose it the application of fractal analysis for description of polymerization kinetics in nanofiller presence. Results and Discussion In previous part of the article the solid-state imidization reactions were represented [1]. Let’s consider the interfacial interactions problem of PI forming macromolecular coil and Na+-montmorillonite on nanofiller surface. As Pfeifer shows [2], a macromolecular coil on hard surface changes its configuration (structure), which can be characterized by its fractal dimension Df. This change is described with the help of the following equation [2]: , (1) where dsurf and d0surf are fractal dimensions of nanofiller surface in nanocomposite and in initial state, respectively, Dfsol and Df are fractal dimensions of PI macromolecular coil in solution (the blending of PAA and Na+-montmorillonite was carried out in N,N-dimethylacetamide solution [3]) and in solid-phase state on nanofiller surface, respectively. Let’s consider the estimation of the parameters including in the equation (1). As it was shown in paper [4], a polymer chain, possessing by finite rigidity and consisting of statistical segments of finite length, was not capable to reproduce growing surface roughness at d0surf increase and at d0surf >2.5 the value dsurf is determined as follows [5]: . (2) For Na+-montmorillonite the value d0surf is determined experimentally and equal to 2.78 [6]. The value Dfsol can be accepted in the first approximation equal to macromolecular coil dimension in a good solvent (Dfsol =1.667 [7]). Then the estimation according to the equation (1) gives Df =1.33. It is obvious, that this dimension of the macromolecular coil, stretched on Na+-montmorillonite surface will be designated further as Df0. The calculation of real

values of macromolecular coil fractal dimension Df for the first order reaction, which is solid-state imidization [3], can be fulfilled with the help of the equation: (3) In other words the calculation according to this equation shows that for the studied imidization reactions the condition Df0