I draw readers’ attention to the importance of the kinetic energy contribution which has been systematically ignored in the partition functions of worm-like objects in a thermal bath. The kinetic energy of linear aggregates is shown to play a unique role when they are reversibly formed from solute molecules in an isotropic solvent. The kinetic energy contribution to the partition function of an $n$-mer is modeled by the term $n^q$, where $q$ is determined by the persistence lengths of different translation-rotation modes (e.g., $q = 5$ for a rigid rod and $q \approx 0$ for a very flexible chain). The $n$-mer concentration is found to depend on the solute concentration $c$ via its powers which are fully determined by the parameter $q$. The model gives rise to two different aggregation regimes: A low $n$ regime for lower $c$, and a high $n$ regime for higher $c$. The total aggregate concentration is found to be a sum of universal power laws of $c$ with the exponents that are different in different regimes, but in both cases are determined solely by the parameter $q$. The analytical formulas for the two regimes and the crossover point are in a quantitative agreement with the numerical solution of the model. The model is pertinent to self-assemblies of plank-like dye molecules dissolved in an isotropic solvent (related to lyotropic chromonic liquid crystals).