

## 금 나노판을 이용한 나노부품 제작

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### Fabrication of nanocomponents using Au nanoplates

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and Kwang Cheol Lee

**Key Words:** Nanocomponent (나노부품), Nanoplate (나노판), Ion milling (이온식각), Focused ion beam (집속이온빔)

**Abstract :** We suggest an approach to the fabrication of nano-sized components designed deliberately by selective Ga<sup>+</sup> focused ion beam etching or Ar<sup>+</sup> ion milling of Au nanoplates synthesized by the chemical reaction. The nanocomponents have various shapes like gear, letter 'A' etc. with in-plane size less than 500 nm and thickness of 20~50 nm. They can be or moved freely one by one to be assembled into sophisticated nanodevices or micromachines. The applicability of our approach to the applied research will be discussed.

## N $\sigma$ T 분자동역학 시뮬레이션을 이용한 고체 재료의 역학적 물성 해석

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### Prediction of solid material properties using fully flexible molecular dynamics simulation

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**Key Words:** molecular dynamics(분자동역학), flexible cell(변형가능 셀), metric tensor(메트릭 텐서)

**Abstract :** In this paper the fully flexible cell molecular dynamics simulation is performed. The flexible cell is based on the metric tensor as extended variable. This flexible cell variable is combined with Nosé-Poincaré thermostat which is obtained through a Poincaré transformation. This extended Hamiltonian approach preserves Hamiltonian in structure, and it can use symplectic integrator. In the present study, the generalized leap-frog method was employed. The resulting molecular dynamics simulation was performed for perfect and defected solid materials in the fcc crystal structure in system with periodic boundary conditions. Uniaxial tension and simple shear bulk test were performed to predict solid material behaviors.