Single Molecule Machineries

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There is no physical limitation for the miniaturization of a machine down to the scale of a single molecule or conversely for a molecule to become a machine at the nanoscale. A few prototypes of molecule-machinery are already under testing like a molecule-wheelbarrow (2 nm), the surface molecule-atom cleaner (1.3 nm), a few others molecules have been designed and used as experimental physical nano-devices like a molecule-gear (1.2 nm), a rack & pinion molecular machinery or a molecule-NOR logic gate (1.4 nm). Others molecules are at their early design and synthesis stages like the molecule-Morse manipulator, the molecule-motor or a molecule-½ digital adder. Those examples will be illustrated pointing out the construction of new interconnection machines able to exchange in a multi-channel mode and with an atomic scale precision: data, synchronization signals or energy with a single molecule, just a nanometer in size.