

**Supporting Information**

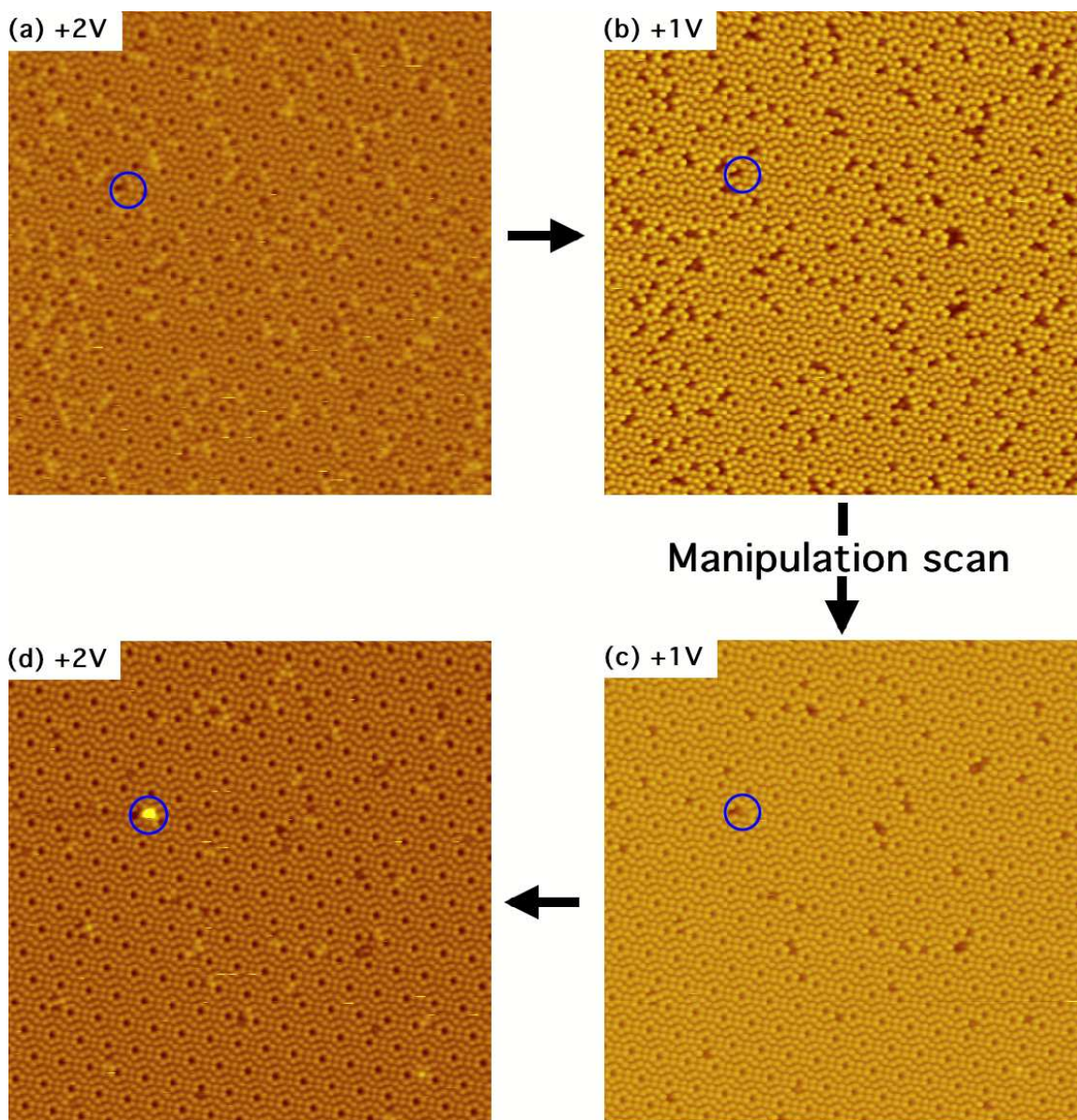
**A New Mechanism of Atomic Manipulation: Bond-Selective  
Molecular Dissociation *via* Thermally Activated Electron  
Attachment**

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Figure 1 presents an example of a set of large scale STM images showing the  
dissociation of chlorobenzene molecules.



**Supplementary Figure 1:** Sequential STM images ( $450 \text{ \AA} \times 450 \text{ \AA}$ ) demonstrating dissociation of a chlorobenzene molecule on Si(111)- $7 \times 7$ . (a), (b) STM images before manipulation at a surface bias voltage of (a) +2 V and (b) +1 V and (c), (d) afterwards at (c) +1 V and (d) +2 V (tunnel current 100 pA). The blue circle indicates the adsorption site of a chlorine atom, dark at +1 V (c) and bright at +2 V (d), that is liberated from a chlorobenzene molecule.