## **Supporting Information**

## The O, OH and OOH-Assisted Selective Coupling of Methanol on

## Au-Ag(111)

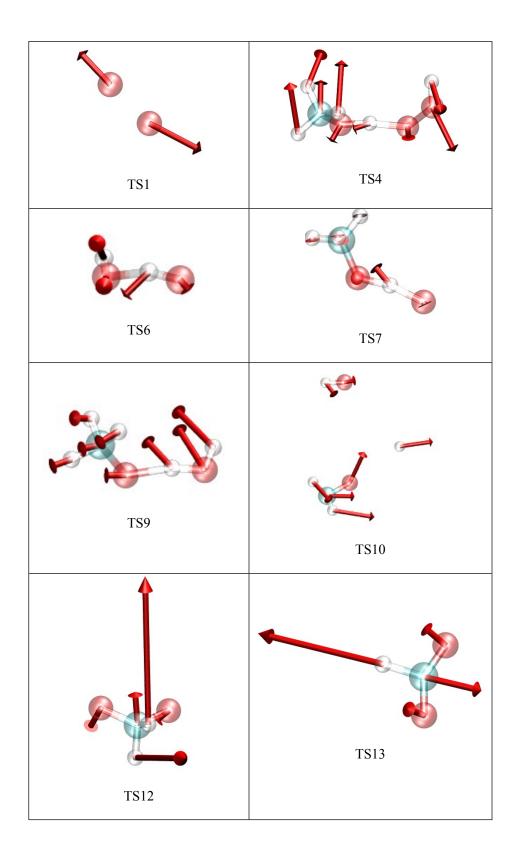
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**Figure S1.** The vibrational modes of the imaginary frequency of several key transition states.