

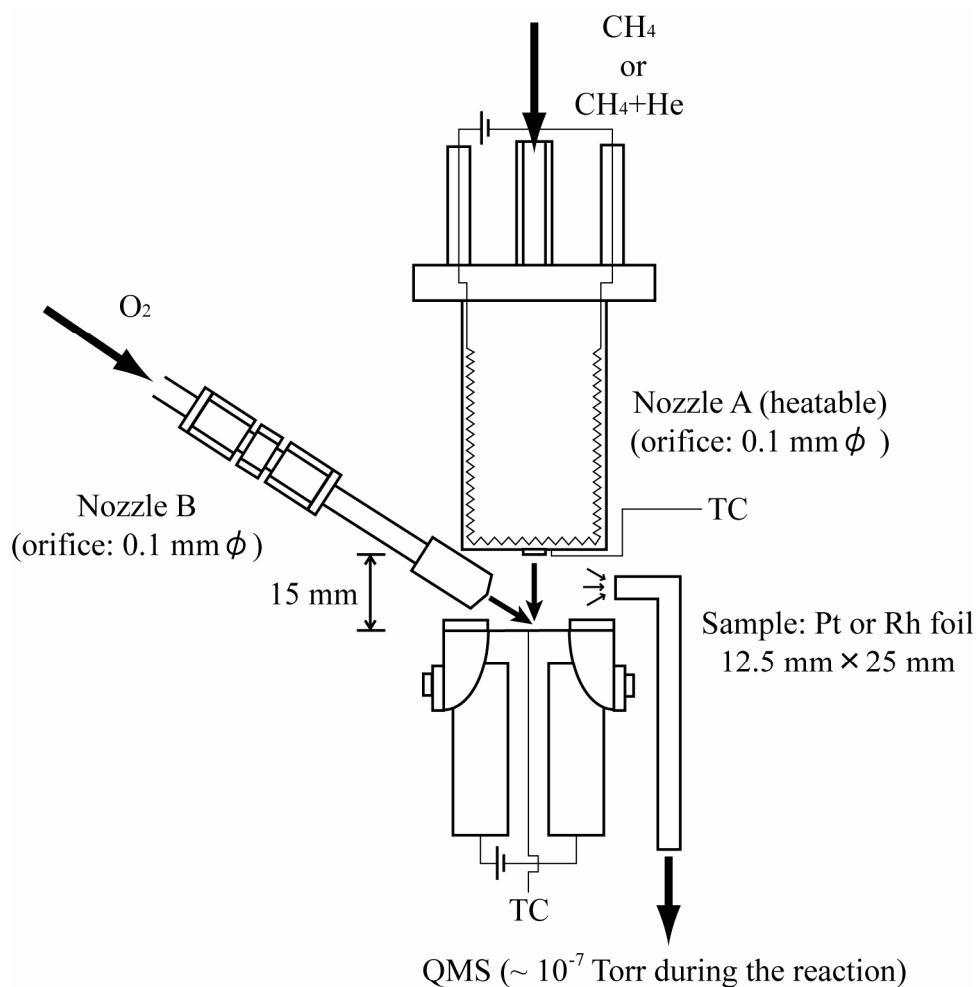
Electronic Supplementary Information

## Promoting effect of energetic activation of methane molecular-beam in direct catalytic partial oxidation of methane

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**Figure** Schematic diagram of a molecular-beam reaction apparatus.  
The background pressure in the QMS chamber reaches  $5 \times 10^{-9}$  Torr.