

***Supporting information for***

**Mechanistic study of 1,1-dimethylhydrazine transformation over Pt/SiO<sub>2</sub> catalyst**

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Table S1 Characteristic ions in the mass spectra of UDMH and major products of its transformation

Compound	Ions (m/z)
$(\text{CH}_3)_2\text{N-NH}_2$ (UDMH)	<b>60</b> , 42, <b>45</b> , 59, 18, 28, 30, 15, <b>43</b> , <b>44</b>
$\text{O}_2$	<b>32</b> , <b>16</b>
$\text{H}_2$	<b>2</b>
$\text{N}_2$	<b>28</b> , 14
$\text{CH}_4$	<b>16</b> , 15, 14, 13
$\text{NH}_3$	<b>17</b> , <b>16</b>
$(\text{CH}_3)_2\text{N=N}$ (DMDA)	15, <b>43</b> , <b>28</b> , <b>58</b> , 27, 42
$(\text{CH}_3)_2\text{NH}$ (DMA)	<b>44</b> , <b>45</b> , <b>28</b> , 42, 43
$(\text{CH}_3)_2\text{N-N=CH}_2$ (DMMH)	<b>72</b> , 42, 71, 30, 57, 43
$\text{CH}_3\text{OH}$	<b>31</b> , <b>32</b> , <b>29</b> , 15
$\text{CH}_2\text{O}$	<b>29</b> , <b>30</b> , <b>28</b>
$\text{NO}_x$	<b>30</b> , <b>44</b> , <b>28</b> , 46 <b>16</b> , 14,
$\text{CO}_2$	<b>44</b> , 28
$\text{H}_2\text{O}$	<b>18</b> , <b>17</b>
$\text{HCN}$	<b>27</b> , <b>26</b>

The ions used for identifying the corresponding compounds are marked bold.

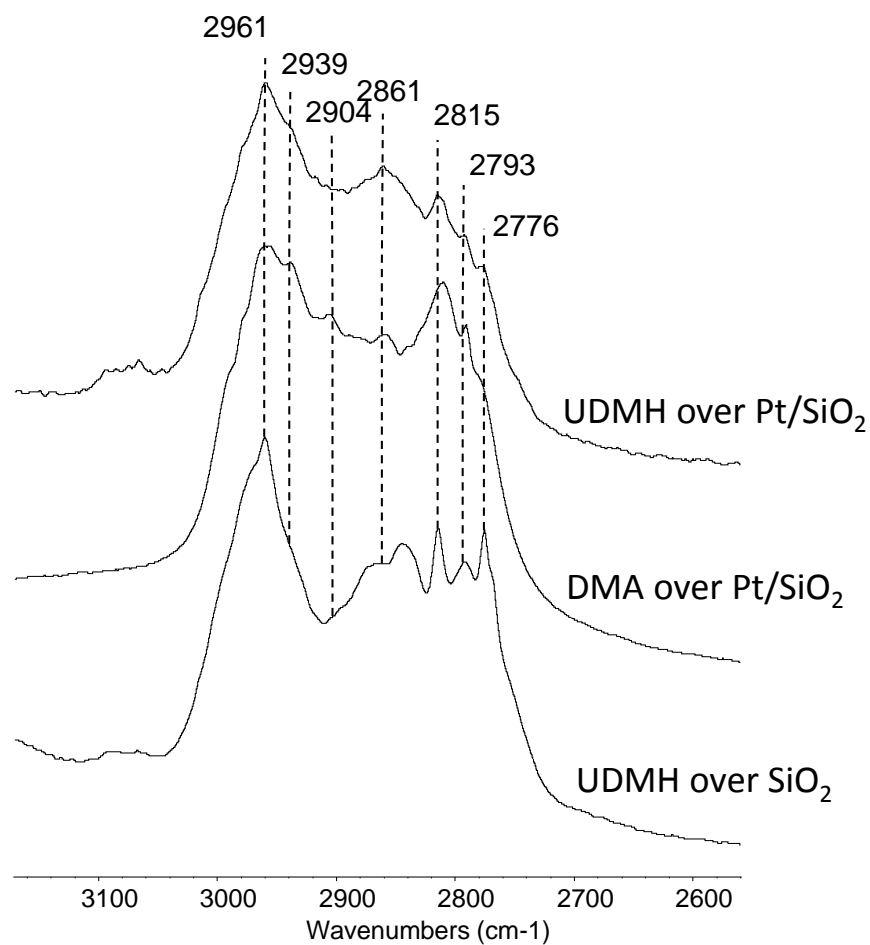


Fig. S1. *In situ* FTIR spectra obtained after UDMH pulse over Pt/SiO<sub>2</sub> and pure SiO<sub>2</sub> in 3%O<sub>2</sub>/He flow, and after DMA pulse over Pt/SiO<sub>2</sub> at 533 K.

Shoulder at 2939 cm<sup>-1</sup> corresponds to product of UDMH conversion – DMA, as verified by separate experiment. So, various species may contribute to observed picture in C-H stretching region of the spectra.

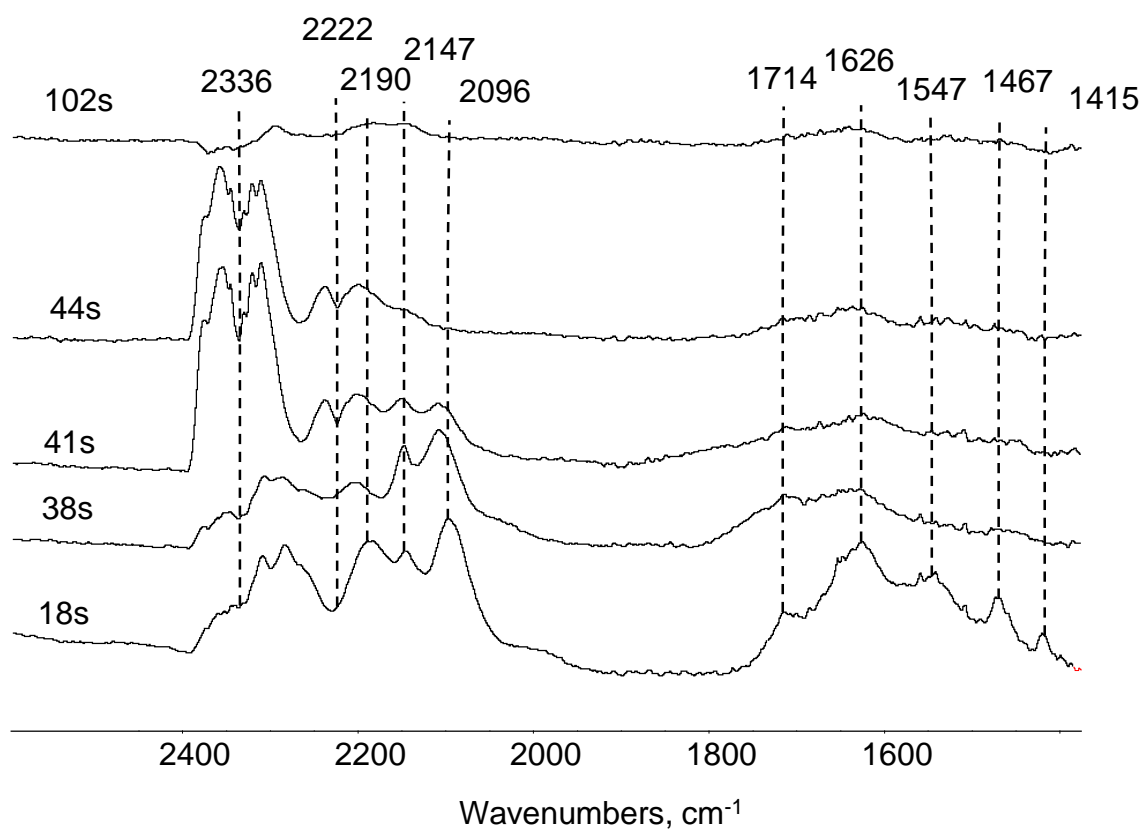


Fig. S2. *In situ* FTIR spectra of Pt/SiO<sub>2</sub> sample exposed to DMA pulse in 3%O<sub>2</sub>/He flow at 533 K.

Bands at 2190, 2147 and 2096 cm<sup>-1</sup> due to C≡N vibrations were found in spectra of DMA reaction over Pt/SiO<sub>2</sub>. This data clearly shows that DMA is an important intermediate in UDMH transformation to surface deposits.