**Electronic supplementary materials** *Mendeleev Commun.*, 2017, **27**, 355–356

# A new type of the dinitrogen pentoxide–acid interaction

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## Experimental

### General Details

Dinitrogen pentoxide was prepared by the known procedure from $HNO_3$ and $P_2O_5$ and subjected to extra purification over $P_2O_5$ *in vacuo* (680 Torr)[1]. The Raman spectra in the 100–2000 $cm^{-1}$ range were recorded using a Lab RAM Jobin-Yvon laser Raman spectrometer equipped with a cooled CCD detector. The excitation line was 632.8 nm of a He-Ne laser and the radiation power on the sample did not exceed 2 mW. The spectral resolution was 2 $cm^{-1}$. The spectra were recorded for the samples plugged in glass ampoules under argon atmosphere. The $^{14}N$ NMR (21.69 MHz) spectra were recorded on a Bruker AM300 spectrometer with an external capillary with acetone-$d_6$ as a lock solvent when used with non-deuterated solvents. The $^{14}N$ NMR spectra were recorded with $MeNO_2$ (10–15 mg) as the internal standard (the up-field chemical shifts have negative values). The quantum chemical calculations of the reaction equilibrium were performed using a programme package Gaussian 09 Revision D.01 DFT B3LYP/6-311++g(d,p)[2].

**Experimental Details**

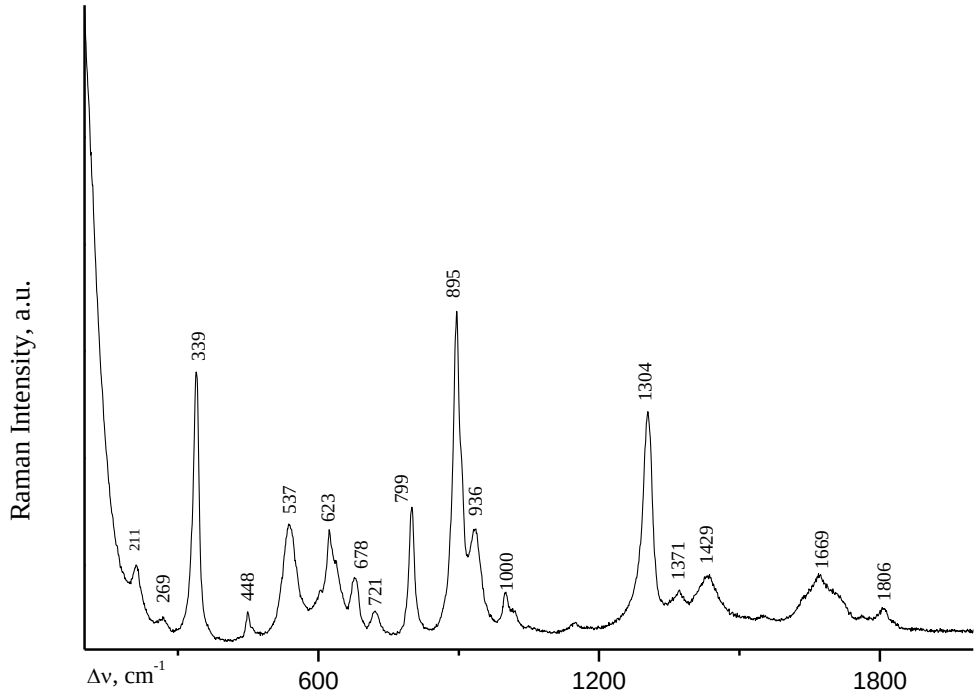


**Figure S1** Raman spectrum of the $AcONO_2$—$HNO_3$ mixture in AcOH resulting from $N_2O_5$ dissolution in excess AcOH (1 : 4, mol).

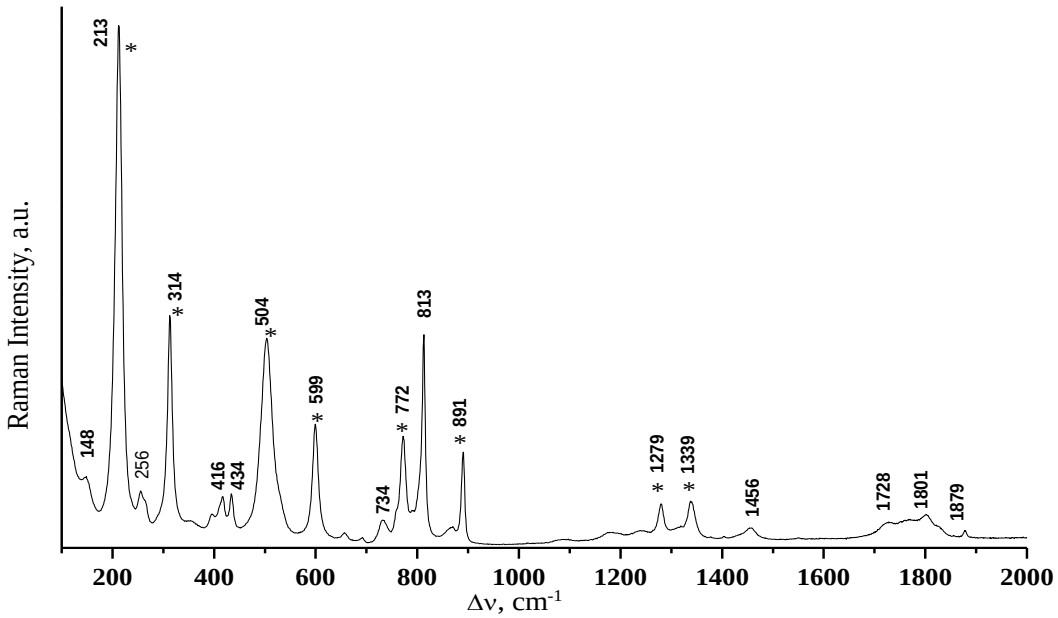


**Figure S2** Raman spectrum of the freshly prepared TFAN solution in TFA resulted from the TFAA—$HNO_3$ mixture (1 : 1, mol, 0–5 °C, 0.5 h). The lines corresponding to the TFAN spectrum are marked with asterisks.

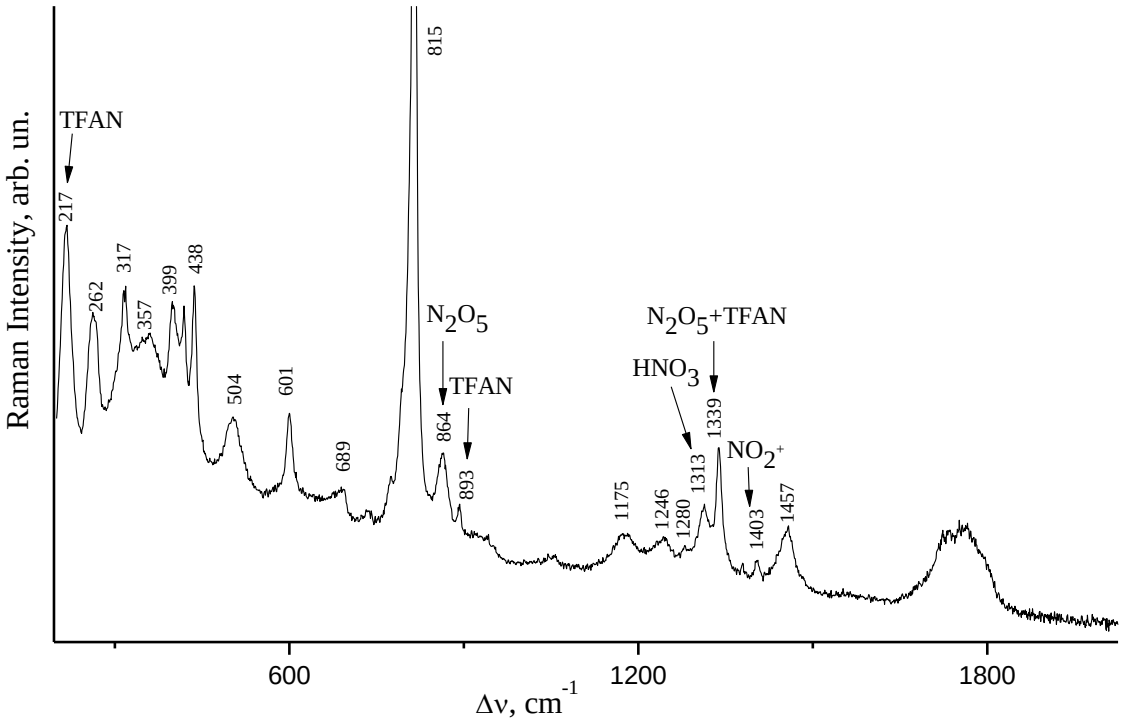


**Figure S3** Raman spectrum of $N_2O_5$ solution in TFA (4 : 1, mol) at 0.5 h after dissolution, 0–5 °C.

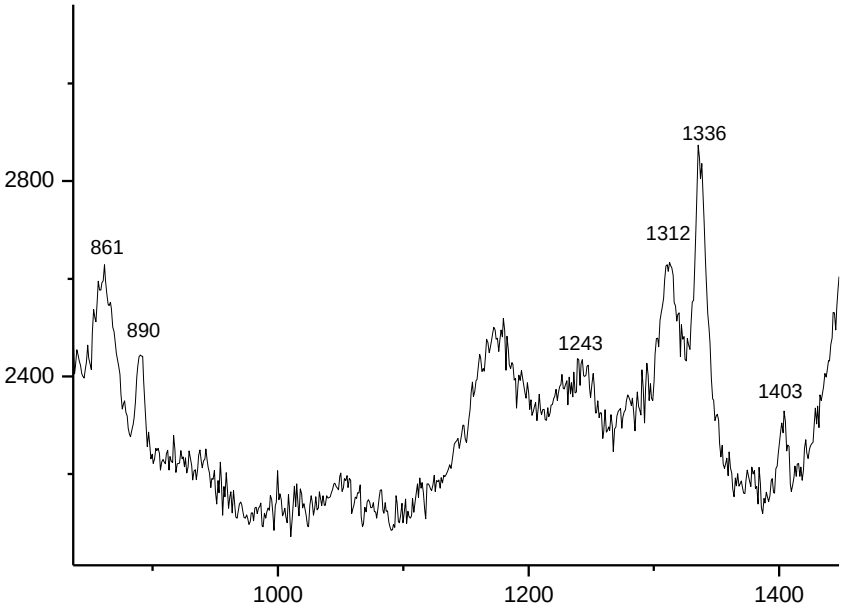


**Figure S4** Raman spectrum of the $N_2O_5$ solution in TFA (8 : 1, mol) at 0.5 h, 0–5 °C.

**References**

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