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Erratum: Radiolysis of N₂O:CO₂ Ice by Heavy Ions: Simulation of Cosmic Ray Effects

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In our recent paper ‘Radiolysis of N₂O:CO₂ Ice by Heavy Ions: Simulation of Cosmic Ray Effects’ published in Mon. Not. R. Astron. Soc. 478, 4939 – 4951 (2018), some errors came to our attention after the publication online, such as two missing spectra in Fig. 1, and some minor errors in Table 3.

In this Erratum, errors have been identified and corrected, as follows:

1 - Column density unit, throughout the paper, is always molecule cm⁻².

2 - A-values, throughout the paper, always refer to band strength.

3 - Fig. 1: the missing spectra in panels (a) and (b) are now shown (see on right column).

4 - In Fig. 2, panel (a), the correct label over the peak at about 3600 cm⁻¹ is CO₂.

5 - Page 2 (Experimental Setup), column 2, third paragraph, the correct value for the density of pure CO₂ is 0.98 g cm⁻³ (Luna R. et al. (2012)). As a consequence, the estimated value for the ice thickness is about 0.38 μm. Since the penetration depth of the 90 MeV ¹³⁶Xe²³⁺ ions used in this work is equal to about 18 μm (>>0.38 μm), the new value of ice thickness does not change the current results and conclusions.

6 - Page 3 (Results), column 2: 4th paragraph has a typo: Tables 1 and 2 instead of Tables 1tbl2.tab.

7 - Table 1: the footnote reference Yamada & Person (1964) is (d).

8 - Table 2: the correct reference for footnote (b) refers to de Barros et al. (2017).

9 - In Table 3, References ^fJamieson, Mebel & Kaiser (2006) and ^hGerakines et al. (2001) are not relevant for this work. The correct Table 3 is presented below.

10 - Fig. 6: the band at about 1980 cm⁻¹ is an artifact.

11 - Table 4, the correct caption is: Characteristics of the N₂O and CO₂ products formed in the N₂O:CO₂ radiolysis.

12 - Page 9, Section 4.2.2: typing error: 216-cm⁻¹ is 2164 cm⁻¹.

13 - Fig. 10 (a): the label of the band at about 2280 cm⁻¹ in the bottom left corner refers to ¹³CO₂.

14 - In the reference list there are two missing references:

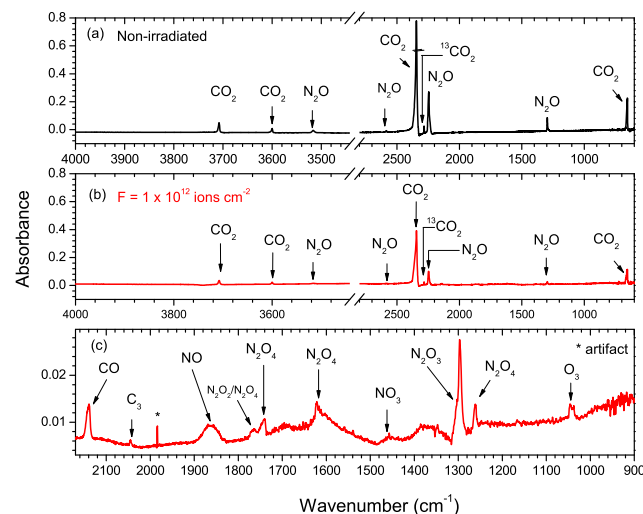


Figure 1. Infrared spectra showing radiolysis effects on N₂O:CO₂ ice: (a) spectrum of the non-irradiated ice mixture from 4000 to 600 cm⁻¹; (b) spectrum after 1.0 × 10¹² ions cm⁻²; and (c) zoom of the previous spectrum, in the 2170 to 900 cm⁻¹ region. The N₂O₃ band peaked at 1305 cm⁻¹ appears as a shoulder band after de-convolution of the N₂O fundamental band (1296 cm⁻¹).

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Table 3. IR band characteristics for the observed product species: assignment, wavenumber position, wavelengths, and band strength (A-value).

Molecule	Assignment	Current wavenumber (cm^{-1})	Wavelengths (μm)	Wavenumber literature Value (cm^{-1})	Band strength (10^{-18} cm molecule $^{-1}$)
CO	ν_1	2138	4.67	2139 ^a	11.0 ^a
CO ₃	ν_3	2045	4.89	2045 ^b	89.0 ^b
NO	ν_1	1848→1869*	5.41→5.35	1869 ^d	4.5 ^c
N ₂ O ₄	ν_9	1741	5.74	1741 ^e	5.0 ^e
N ₂ O ₂ /N ₂ O ₄	ν_5	1765	5.67	1764 ^d	–
N ₂ O ₄	ν_2	1621	6.17	1628 ^f	59.5 ^f
NO ₃	ν_1	1460	6.85	1471 ^f	7.6 ^f
N ₂ O ₃	ν_1/ν_3	1305	7.66	1303 ^f	46.3 ^f
N ₂ O ₄	ν_{11}	1260	7.94	1262 ^f	85.0 ^f
O ₃	ν_1	1037	9.64	1040 ^f	14.0 ^f

Note. ^aPalumbo & Strazzulla (1993), ^bBennett et al.(2004), ^cSicilia et al. (2012), ^dFateley, Bent & Crawford (1959), ^eFulvio et al. (2009), ^fJamieson et al. (2005). *The arrow means blue shift of the NO band along the irradiation.

REFERENCES

Bennett C. J., Jamieson C., Mebel A. M., Kaiser R. I., 2004, *Physical Chemistry Chemical Physics*, 6, 735
 de Barros A. L. F., da Silveira E. F., Fulvio D., Rothard H., Boduch P., 2017, *MNRAS*, 465, 3281

Luna R., Satorre M. A., Domingo M., Millán C., Santonja C., 2012, *Icarus*, 221, 186

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