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INVESTIGATION OF ELASTIC ELECTRON SCATTERING BY ANAESTHETIC MOLECULES IN GASEOUS PHASE

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Abstract. Driven by their significant impact on both global warming and ozone depletion, we conducted collaborative theoretical and experimental studies on the elastic electron scattering from anesthetic molecules (halothane, sevoflurane, isoflurane, and desflurane) at intermediate electron energies. Studies have revealed that most administered anesthetics are excreted unchanged from the patient's body into the lower atmosphere, with their release steadily rising over time. As halogenated compounds, anesthetics possess high Global Warming Potentials (GWP), and the majority among them exhibit substantial Ozone Depletion Potentials (ODP). Experimental investigations were conducted employing a crossed-beam setup, consisting of an electron gun, a single capillary gas needle, and a detection system equipped with a channeltron. To establish the absolute scale for the measured relative cross sections, the relative-flow method was employed, with argon gas serving as a reference. Theoretical calculations of the differential cross sections were conducted using the Independent Atom Model along with the Screening Corrected Additivity Rule, incorporating interference effects (IAM-SCAR+I).

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References

Langbein, T., Sonntag, H., Trapp, D., Hoffmann, A., Malms, W., Röth, E.P., Mörs, V., Zellner, R.: 1999, *Br. J. Anaesth.,* **82**, 66–73.

Maljković, J.B., Vukalović, J., Pešić, Z.D., Blanco, F., García, G., Marinković, B.P.: 2023, *Eur. Phys. J. Plus,* **138**, 349.

Vukalović, J., Maljković, J.B., Blanco, F., García, G., Predojević, B., Marinković, B.P.: 2022, *Int. J. Mol. Sci.*, **23**, 21.

Vukalović, J., Marinković, B. P., Rosado, J., Blanco, F., García, G., Maljković, J. B.: 2024, *Phys. Chem. Chem. Phys.*, **26**, 985-991.