

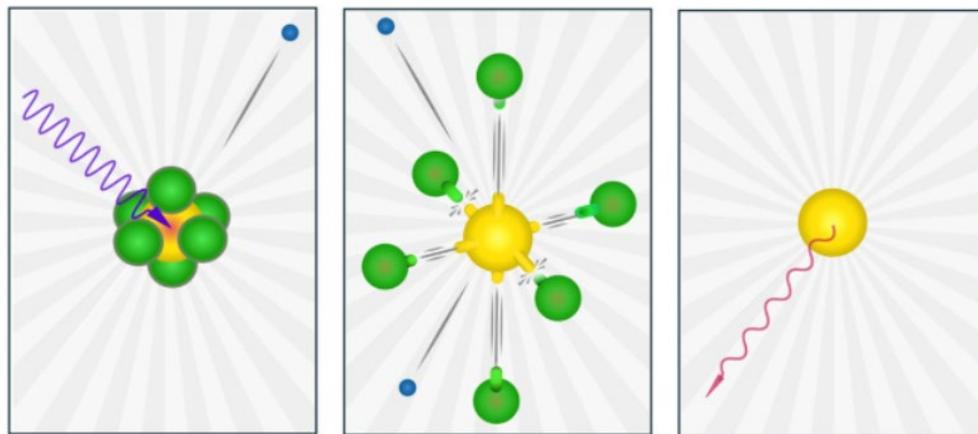
化学反应

Decades of Discovery:

– Neutral Sulfur in SF₆ Decay Under High-Energy X-Ray Exposure –

- To uncover the hidden nature of the SF₆ spectrum, the scientist collaborated with an international team from Europe and Japan, leveraging modern X-ray sources.
- Using advanced synchrotron radiation techniques, the study provided insight into the formation of neutral sulfur atoms during the decay of deep core holes in SF₆.
- In the experiment, SF₆ molecules were exposed to hard X-rays that excited sulfur's innermost electron shells, initiating a cascade of electronic decays leading to the molecule's complete dissociation.
- Advanced ab initio theoretical calculations were critical for interpreting the observed soft X-ray emissions and for understanding the complex molecular response to deep inner-shell ionization of sulfur in SF₆.
- This study demonstrates the power of modern X-ray techniques in unraveling long-standing scientific mysteries and advancing our understanding of molecular dynamics.

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On the right a SF₆ molecule is hit by a 2.5 keV photon, creating a 1s hole in the sulfur atom. In the middle an Auger cascade relaxation emits electrons causing dissociation. While on the right a sulfur atom retains its electrons in a neutral 2p excited state and emits a 150 eV photon. ©Tohoku University