LINE ASSIGNMENT OF JWST SPECTRUM USING NIST ATOMIC SPECTRA DATABASE

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Basis of Research: Recently, Berné et al. (2023) published a paper on a JWST emission spectrum, which they assigned to CH_3+. For example, they assigned the strong emission lines from the 7.1752 μm to 7.1622 μm as the Q branch lines of the ν_2 fundamental band of CH_3+.

Assignment using the NIST Database: These spectral lines are readily assigned as due to atomic emission lines based on the NIST atomic spectrum database. For example, the line at 7.1752 μm is due to Magnesium and the 7.1622 μm is due to Nitrogen 4+.

Conclusion of Research: The JWST spectrum is not due to CH_3+. Molecular infrared emission is very weak. It is observable only from planets but not from interstellar space.

*Berné, O. and 57 authors, 2023, Nature accelerated article preview.