CHARACTERIZATION OF $C_3HSi$

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Structural and spectroscopic properties of the astrophysically relevant $SiC_3H^-$ anion are investigated at the RCCSD(T) and CASSCF levels of theory. The molecule presents a total of 12 isomers (4 linear and 8 cyclic), all of them showing singlet ground electronic states. The stability of the linear isomer $l - SiC_3H^- (X^1\Sigma^-)$ is notorious. The B0 rotational constant of $l - Si^{12}C_3H^-$ and $l - Si^{12}C_3D^-$, the dipole moment, excitation energies to the lowest electronic states and electron affinities have been estimated.