

Are There Silicate–S Stars?

IRENE R. LITTLE–MARENIN

Wellesley College, Wellesley MA, U.S.A.

I have identified seven S stars with very strong silicate features in their IRAS LRS spectra at 10 and 18 μm (LRS 25–29) (Chen et al. 1995, *A&AS*, 113, 51). This is highly unusual since S stars tend to have lower mass-loss rates and higher gas-to-dust ratios than M or C stars, implying less efficient dust formation in their circumstellar shells. Gas-to-dust ratios are estimated to be between 400 and 1000, at least a factor of two lower than for carbon stars, and hence strong dust emission features are not seen or expected. Also, pure S stars have a relatively weak emission feature which peaks in the 10–11 μm region and is subtly different from the 10 μm silicate or the 11.2 μm SiC feature. However, all seven stars have been found to be either M or MS stars rather than pure S stars, and hence they reflect the mass-loss rates and dust content associated with M stars. The stars and their characteristics are listed below.

Table 1: S? Stars with Strong Silicate Emission Features

IRAS	Name	GCSS	LRS	<i>l</i>	<i>b</i>	Sp. Class
07197 – 1451	TT CMa	341	27	230	–0.2	not S, maybe MS (a)
11169 – 6111		738	29	292	–0.5	M5.5, not S (b)
15347 – 5555		897	26	325	–0.5	M3 (b)
16490 – 4618		944	25	340	–1.5	M1.5 (b)
19545 – 1122	V1407 Aql	1175	29	30	–19.6	M6S (c)
21029 + 4917		1259	28	90	+1.7	M3 (d)
22512 + 6100	V386 Cep	1314	28	109	+1.6	M6 (c), M3 (a)

(a) Stephenson, private communication; (b) Lloyd Evans & Catchpole 1989, *MNRAS*, 237, 219; (c) Bidelman, private communication; (d) Cohen et al. 1989, *AJ*, 97, 1759