THE HALO PLANETARY NEBULAE M2-29 AND BB-1

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The physical conditions and chemical abundances were determined for M2-29 and BB-1 from optical spectrophotometric data and from available IUE material (Table 1). M2-29 has the lowest O/H ratio in PNe and it belongs to the Ar and S rich type IV PN group while BB-1 is very C, N, and Ne rich being Ar and S poor. Comparing with all known PNe of type IV it is found that C/N/O/Ne/Ar do not vary in lockstep, but C, N, O and Ne appear enriched in Ar poor objects (Table 2). C and N are expected to be enriched by the central star, however the anomalous O/Ne/Ar behavior is not understood unless O and Ne are also enriched by the progenitor star. The paper in full will appear in P.A.S.P. 1991.

Table 1. Derived Temperature, Density and Chemical Composition

	Te	Ne	He	C	N	O	Ne	S	A
M2-29	24000	3000	10.97	——	6.98	7.31	6.72	5.91	5.26
BB-1	14500	3000	11.02	9.16	7.94	7.68	7.76	5.80	4.74

Table 2. Comparison with other objects (in 12 + log X/H)

object	He	O	C/O	N/O	Ne/O	S/O	Ar/O
M 2-29	10.97	7.3	——	-0.3	-0.6	-1.4	-2.0
BB-1	11.02	7.7	+1.5	+0.2	+0.1	-1.9	-3.0
K 648	11.02	7.7	+1.0	-1.2	-1.0	-2.5	-3.4
H 4-1	10.99	8.4	+0.9	+0.1	-1.7	-3.2	-3.7
NGC4361	11.02	7.8	+0.5	<-0.4	-0.2	——	-1.9
NGC2242	11.00	8.0	+0.4	-0.3	-0.2	——	-2.1
DDDM-1	11.00	8.1	<-1.0	-0.7	-0.7	-1.6	-2.3
PN06-41.1	10.96	8.1	<-0.8	——	-0.6	——	-2.3
PN242-37.1	11.03	8.4	<-0.8	<-0.4	-0.5	——	-2.0
Sun	——	8.9	-0.2	-0.9	-0.8	-1.6	-2.3

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