

Table 5.4 from (59AJ76): Phase shifts in ${}^4\text{He}(p, p){}^4\text{He}$ ^a

E_p (lab) (MeV)	$S_{1/2}$ (deg)	$P_{1/2}$ (deg)	$P_{3/2}$ (deg)	$D_{3/2}$ (deg)	$D_{5/2}$ (deg)	References
0.95	-12.0	3.3	3.3	0	0	(CR49A, FR49C)
1.49	-18.1	4.1	20.4			(CR49A, FR49C)
1.70	-17.6	4.2	31.1			(CR49A, FR49C)
2.02	-24.6	8.1	47.8			(CR49A, FR49C)
2.22	-26.7	9.4	60.6			(CR49A, FR49C)
2.53	-28.2	13.1	78.8			(CR49A, FR49C)
3.03	-27.3	10.3	99.3	0.7	0.1	(MI58A)
3.04	-32.0	15.7	96.6			(CR49A, FR49C)
3.51	-30.9	18.8	107.6	1.3	-1.1	(MI58A)
3.58	-35.2	20.3	105.4			(CR49A, FR49C)
4.02	-32.9	23.6	112.4	2.1	-1.7	(MI58A)
4.50	-43.1	29.1	111.6	-3.1	-0.5	(MI58A)
5.00	-51.8	35.5	109.9	-4.7	0.1	(MI58A)
5.1	(no analysis)					(BR51H)
5.78	-47.9	38.7	112.9	-1.3	-0.49	(DO52B, KR54, LU55A)
7.50	-57.95	52.51	112.1	-1.87	+0.44	(PU56A)
9.48	-65.36	54.72	109.2	-5.73	-3.21	(PU52A, PU56A)
9.55	(optical model)					(FR54H, GI57: see (WI55C, HO57D))
9.76	(no analysis)					(WI55C)
9.8	(no analysis)					(CO54G)
12.0	-66.9	60.1	108.7			(BR57K) ^b
14.0	-76.7	50.2	92.7			(BR57K) ^b
16.0	-81.1	49.1	89.5			(BR57K) ^b
17.0 ^c				(-14)	(-17)	(AL54C)
17.45	-85.7	53.2	94.8			(BR56A, BR57K)
18	-85.8	46.4	85.4			(BR56A, BR57K)
19.4	(no analysis)					(VA56B, VA57B)
27.9	(no analysis)					(WI57F)
31.6	(no analysis)					(CO53L)
39.85	(optical model)					(BR57B)
95	(no analysis)					(TE55)

^a Phase shifts for $E_p = 1$ to 18 MeV are plotted by (MI58A); extrapolated values from 10 to 40 MeV are tabulated by (GA58).

^b (BR57K) also tabulates values for $E_p = 13, 15$ and 17 MeV; D-wave $< 8^\circ$.

^c From ${}^4\text{He}(n, n){}^4\text{He}$.