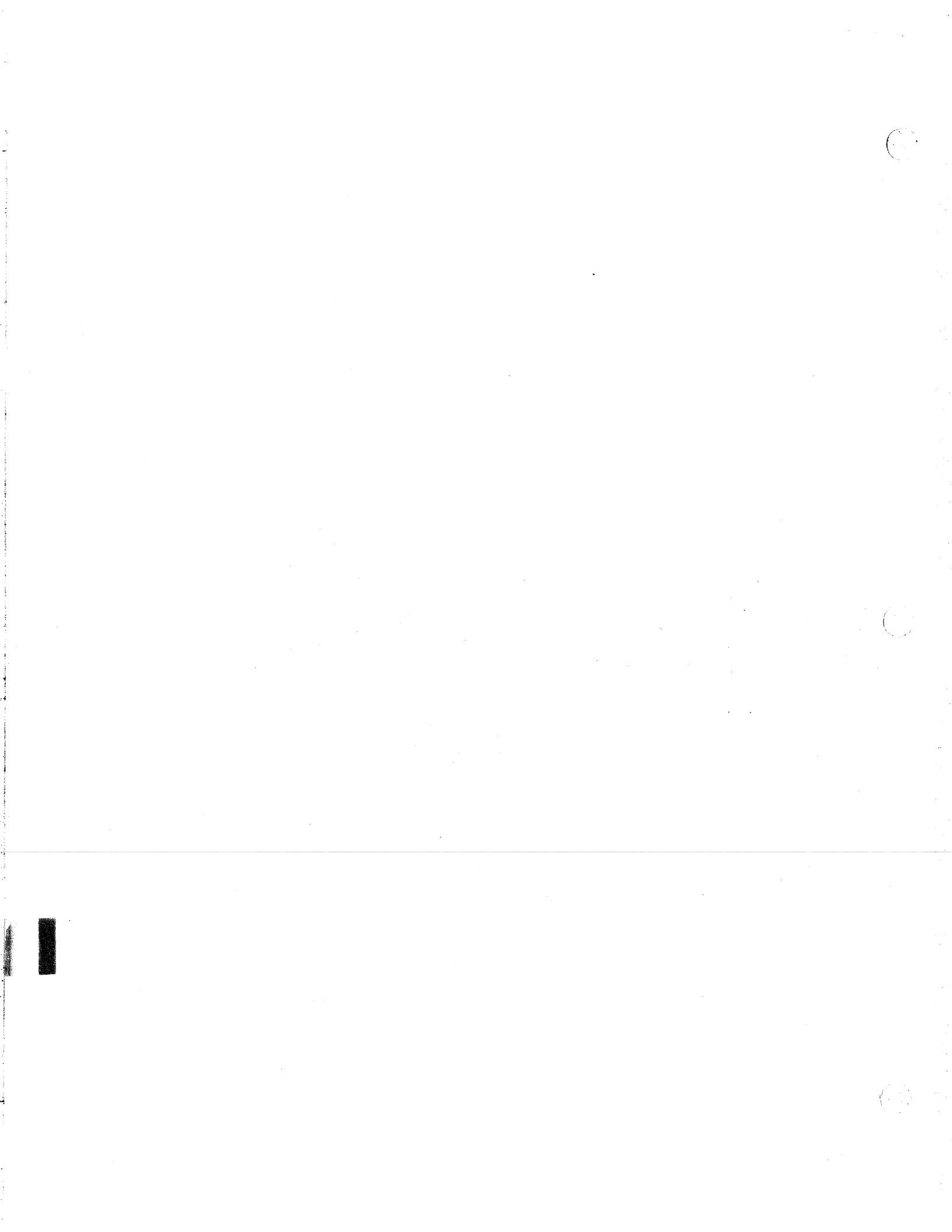


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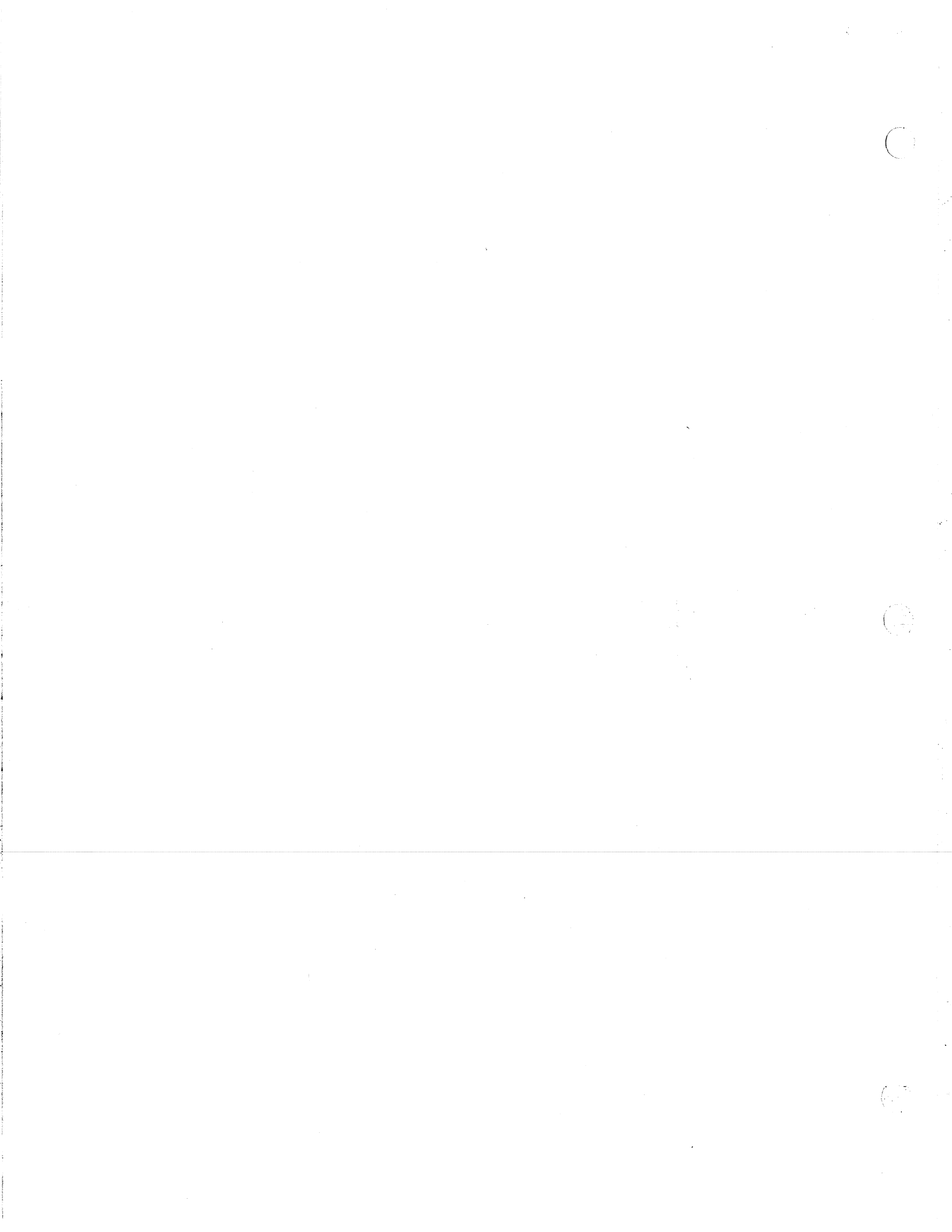
Experimental Differential Cross-Sections
for 40-MeV Proton Inelastic Scattering
on ^{50}Ti , ^{51}V , and ^{52}Cr

B.M. Freedom, C. R. Gruhn, T.Y.T. Kuo and C.J. Maggiore



Preface

These tables contain the data that was presented in the article "40-MeV Proton Inelastic Scattering on ^{50}Ti , ^{51}V , and ^{52}Cr and its Microscopic Description" by B. M. Freedom, C. R. Gruhn, T. Y. T. Kuo, and C. J. Maggiore. This article was published in Physics Review C2, 166(1970).



$^{50}\text{Ti}(p,p')$ $E^*=2.686$ MeV, $J^\pi=4^+$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
11.2	1.806	18.4
15.3	0.985	13.9
20.4	0.930	5.8
25.5	0.902	3.6
30.6	0.791	3.5
35.7	0.795	3.1
40.8	0.691	2.3
45.9	0.530	2.4
51.0	0.342	2.7
56.0	0.234	3.2
61.1	0.170	3.3
66.1	0.133	3.9
71.2	0.135	3.5

$^{50}\text{Ti}(p,p')$ $E^*=3.879$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
11.2	1.050	43.9
15.3	0.711	25.0
25.5	0.273	8.3
30.6	0.276	6.8
40.8	0.127	8.4
45.9	0.0903	9.7
51.0	0.0725	9.3
56.0	0.0706	8.2
61.1	0.0467	8.9
66.2	0.0332	12.2
71.2	0.0222	14.2
76.2	0.0280	10.5

$^{50}\text{Ti}(p,p)$; $E^*=0$, $J^\pi=0^+$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
11.2	4552.	0.7
15.3	2231.	0.4
20.4	633.	0.2
25.5	79.6	0.3
30.6	37.1	0.4
35.7	98.6	0.2
40.8	107.	0.2
45.9	68.0	0.2
50.9	28.0	0.2
56.0	11.2	0.3
61.0	8.99	0.3
66.1	10.9	0.3
71.1	9.20	0.3
76.2	5.69	0.4
81.2	2.96	0.7

$^{50}\text{Ti}(p,p')$ $E^*=1.555$ MeV, $J^\pi=2^+$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
11.2	8.65	5.8
15.3	6.96	3.6
20.4	5.60	1.8
25.5	4.62	1.4
30.6	2.60	1.8
35.7	1.31	2.3
40.8	8.82	2.0
45.9	1.08	4.8
51.0	1.34	1.3
56.0	1.21	3.3
61.1	0.542	1.7
66.1	0.281	2.6
71.2	0.298	2.3
76.2	0.395	1.8
81.2	0.419	2.2

$^{50}\text{Ti}(p,p')$ $E^*=4.422$ MeV, $J^\pi=3^-$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
11.2	2.265	18.7
15.3	3.526	6.6
20.4	3.600	2.5
25.5	3.758	1.6
30.6	2.762	1.8
35.7	2.178	1.8
40.8	1.540	1.5
45.9	0.996	1.7
51.0	0.790	1.8
56.0	0.772	1.6
61.1	0.661	1.7
66.2	0.520	1.8
71.2	0.359	2.1
76.2	0.246	2.4
81.3	0.172	3.8

$^{50}\text{Ti}(p,p')$ $E^*=4.81$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
11.2	1.473	30.0
15.3	0.847	20.3
20.4	1.233	5.7
25.5	0.816	4.6
30.6	0.580	4.5
35.7	0.312	6.2
40.8	0.197	6.3
45.9	0.146	6.0
51.0	0.164	5.3
56.1	0.112	5.9
61.1	0.0516	8.3
66.2	0.0382	9.9
71.2	0.0436	8.2
76.2	0.0547	6.6
81.3	0.0377	10.6

$^{50}\text{Ti}(p,p')$ $E^*=4.19$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
11.2	1.547	27.4
15.3	1.121	14.8
20.4	1.263	5.2
25.5	1.025	3.5
30.6	0.733	3.6
35.7	0.518	4.5
40.8	0.404	5.6
45.9	0.284	3.7
51.0	0.208	4.0
56.0	0.201	3.6
61.1	0.0926	5.2
66.2	0.0578	22.6
71.2	0.0849	5.0
76.2	0.112	4.0
81.3	0.0950	5.6

$^{50}\text{Ti}(p,p')$ $E^*=4.322$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
11.2	1.197	30.8
15.3	0.847	18.2
20.4	1.108	5.3
25.5	0.894	3.6
30.6	0.447	4.6
35.7	0.263	6.4
40.8	0.155	6.1
45.9	0.196	4.6
51.0	0.225	3.7
56.0	0.164	3.9
76.2	0.0534	5.9
81.3	0.0562	7.1

$^{50}\text{Ti}(p,p')$ $E^*=5.39\text{MeV}$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.4	0.533	13.3
25.5	0.451	7.7
30.7	0.396	6.5
35.7	0.595	4.6
40.8	0.403	4.1
45.9	0.404	3.5
51.0	0.266	4.1
56.1	0.221	3.9
61.1	0.152	4.3
66.2	0.140	4.6
71.2	0.107	5.0
76.3	0.0940	5.1
81.3	0.0708	7.7

$^{50}\text{Ti}(p,p')$ $E^*=5.56\text{MeV}$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.4	0.328	16.5
25.6	0.270	9.7
30.7	0.213	9.9
35.7	0.186	9.7
40.8	0.179	9.8
45.9	0.0711	11.4
51.0	0.0349	20.9
56.1	0.0656	9.3
61.1	0.0515	9.1
66.2	0.0332	39.4
71.2	0.0268	20.2
81.3	0.00643	52.9

$^{50}\text{Ti}(p,p')$ $E^*=4.94$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
15.3	0.610	29.1
20.4	0.228	21.3
25.5	0.433	6.5
35.7	0.153	10.6
40.8	0.111	10.1
51.0	0.0388	21.2
56.0	0.0661	8.5
61.1	0.0310	12.9
66.2	0.0175	37.3
71.2	0.0235	12.5
76.2	0.0242	12.2

$^{50}\text{Ti}(p,p')$ $E^*=5.203$ MeV, $J^\pi=3^-$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.4	0.668	29.7
25.5	0.182	14.4
30.6	0.206	11.1
35.7	0.0941	17.2
40.8	0.0654	16.4
45.9	0.0732	11.1
51.0	0.0357	17.9
56.0	0.0375	13.3
61.1	0.0370	11.6
66.2	0.0195	18.8
71.2	0.0172	19.6
76.2	0.0129	21.2
81.3	0.00757	37.5

$^{50}\text{Ti}(p,p')$ $E^*=6.42$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
25.6	0.212	14.8
30.1	0.147	16.6
35.8	0.205	11.6
40.8	0.152	10.3
45.9	0.116	9.5
51.0	0.0989	9.6
56.1	0.108	7.0
61.1	0.0845	7.0
66.2	0.0520	11.8
71.2	0.0334	12.7
76.3	0.0524	8.5
81.3	0.0367	12.4

$^{50}\text{Ti}(p,p')$ $E^*=6.63$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
15.3	1.059	21.2
20.5	0.817	8.3
25.6	0.539	6.5
30.7	0.517	5.6
35.8	0.380	6.4
40.9	0.237	6.1
45.9	0.183	6.2
51.0	0.161	5.7
56.1	0.200	4.4
61.1	0.157	4.8
66.2	0.104	6.3
71.2	0.0958	5.5
76.3	0.0603	7.1
81.3	0.0439	11.2

$^{50}\text{Ti}(p,p')$ $E^*=5.84$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.4	0.546	13.0
25.6	0.401	7.6
30.7	0.375	6.9
35.8	0.363	6.9
40.8	0.293	5.5
45.9	0.274	5.0
51.0	0.147	6.6
56.1	0.126	6.1
61.1	0.0992	6.3
66.2	0.0847	7.1
71.2	0.0620	8.1
76.3	0.0512	8.7
81.3	0.0246	16.9

$^{50}\text{Ti}(p,p')$ $E^*=6.55$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.5	0.500	12.8
25.6	0.495	7.6
30.7	0.428	6.4
35.8	0.435	6.0
40.8	0.328	4.9
45.9	0.267	4.9
51.0	0.216	4.8
56.1	0.201	4.2
61.1	0.0935	6.4
71.2	0.0596	7.8
76.3	0.0588	6.7
81.3	0.0441	10.7

$^{50}\text{Ti}(p,p')$ $E^*=7.00$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
25.6	0.129	20.9
30.7	0.125	16.3
35.8	0.126	17.2
45.9	0.621	18.7
56.1	0.791	10.0
61.1	0.487	11.9
71.2	0.305	13.2

$^{50}\text{Ti}(p,p')$ $E^*=7.10$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
15.3	2.230	13.0
20.5	1.257	6.8
25.6	1.183	4.3
30.7	0.901	4.3
35.8	0.708	4.8
40.9	0.411	5.0
45.9	0.353	4.6
51.0	0.186	6.5
56.1	0.151	6.1
61.2	0.148	57.
66.2	0.133	6.2
71.2	0.0970	6.4
76.3	0.0659	7.3
81.3	0.0711	8.8

$^{50}\text{Ti}(p,p')$ $E^*=6.74$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
25.6	0.303	11.5
30.7	0.240	11.1
35.8	0.348	7.7
40.9	0.252	6.8
45.9	0.168	7.7
51.0	0.0726	50.4
71.2	0.0399	11.4
81.3	0.0248	17.6

$^{50}\text{Ti}(p,p')$ $E^*=6.89$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
25.6	0.163	18.7
30.7	0.116	20.3
35.8	0.154	16.2
40.9	0.204	8.1
45.9	0.106	10.4
51.0	0.107	9.7
56.1	0.114	7.8
61.1	0.115	6.6
66.2	0.0471	12.2
71.2	0.0364	11.9
76.3	0.0475	10.3
81.3	0.0327	13.9

$^{51}\text{V}(p,p)$; $E^*=0$, $J^\pi=7/2^-$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
11.2	4633.	1.5
15.3	2147.	0.6
20.4	641.	0.4
25.5	95.6	0.3
30.6	22.7	0.4
35.7	76.4	0.3
40.8	88.5	0.3
45.8	57.3	0.3
50.9	23.4	0.4
56.0	8.94	0.6
61.0	7.36	0.6
66.1	9.37	0.5
71.1	8.01	0.6
76.1	5.06	0.8

$^{51}\text{V}(p,p')$ $E^*=0.320$ MeV, $J^\pi=5/2^-$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
11.2	2.566	20.7
15.3	1.188	12.4
30.6	0.626	2.9
35.7	0.330	5.0
40.8	0.269	6.2
45.8	0.251	5.5
50.9	0.283	3.9
56.0	0.279	3.6
66.1	0.116	5.6
61.0	0.204	3.7
71.1	0.114	5.0
76.1	0.107	5.8

$^{50}\text{Ti}(p,p')$ $E^*=7.39$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
25.6	0.325	11.5
30.7	0.191	12.7
35.8	0.168	18.5
40.9	0.105	14.6
45.9	0.0893	15.1
51.0	0.0627	15.5
56.1	0.0509	13.9
66.2	0.0265	23.6
71.3	0.0231	20.7
76.3	0.0126	31.9

$^{50}\text{Ti}(p,p)$ $E^*=7.72$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
25.6	0.578	7.4
30.7	0.432	7.4
35.8	0.458	7.5
56.1	0.144	7.9
61.2	0.115	7.8
66.2	0.0650	11.7
71.3	0.0123	29.2

$^{51}\text{V}(p,p')$ $E^*=1.815$ MeV, $J^\pi=9/2^-$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.4	0.698	8.5
25.5	0.541	5.4
30.6	0.418	3.3
35.7	0.290	4.7
40.8	0.249	5.0
45.9	0.229	4.9
56.0	0.181	3.9
61.0	0.125	4.9
71.1	0.0806	5.9
76.2	0.0600	7.9

$^{51}\text{V}(p,p)$ $E^*=2.411$ MeV, $J^\pi=3/2^-$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.4	0.355	11.4
25.5	0.304	5.7
30.6	0.211	4.7
35.7	0.121	7.8
40.8	0.0857	9.5
45.9	0.0832	8.2
50.9	0.0972	5.7
56.0	0.0686	6.8
66.1	0.0241	29.1
71.1	0.0333	12.8

$^5\text{LiV}(p,p')$ $E^*=0.93$ MeV, $J^\pi=3/2^-$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
15.3	0.538	26.1
20.4	0.316	12.8
25.5	0.382	4.8
30.6	0.248	4.7
40.8	0.142	8.0
50.9	0.138	5.1
56.0	0.0890	5.8
61.0	0.0682	7.3
66.1	0.0351	12.6
71.1	0.0464	7.8
76.2	0.0385	11.1

$^5\text{LiV}(p,p')$ $E^*=1.611$ MeV, $J^\pi=11/2^-$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
15.3	1.254	11.7
20.4	1.321	5.0
25.5	1.158	3.0
30.6	0.809	2.3
35.7	0.446	3.5
40.1	0.332	4.3
45.9	0.313	4.2
50.9	0.377	2.9
56.0	0.341	2.8
71.1	0.110	5.1
76.1	0.118	5.5

$^{51}\text{V}(p,p')$ $E^*=3.43$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
11.2	0.961	33.4
20.4	0.386	10.3
25.5	0.294	6.4
30.6	0.209	5.1
35.7	0.136	7.1
40.8	0.123	7.2
45.9	0.0942	7.6
50.9	0.0838	6.6
61.1	0.0542	9.4
66.1	0.0239	15.0
71.2	0.0313	22.7
76.2	0.0300	13.1

$^{51}\text{V}(p,p')$ $E^*=3.53$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
15.3	0.220	35.7
20.4	0.313	12.2
25.5	0.306	6.4
30.6	0.247	5.0
35.7	0.149	7.1
40.8	0.106	7.7
45.9	0.0744	8.6
51.0	0.0902	6.7
56.0	0.103	5.3
61.1	0.0531	8.8
66.1	0.0232	15.7
71.1	0.0225	12.7

$^{51}\text{V}(p,p')$ $E^*=2.702$ MeV, $J^\pi=15/2^-$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
15.3	0.298	32.9
20.4	0.170	21.9
25.5	0.123	9.9
30.6	0.149	5.9
35.7	0.172	6.2
40.8	0.147	6.9
45.9	0.123	6.4
50.9	0.101	5.7
56.0	0.0744	6.5
61.1	0.0621	7.6
71.1	0.0527	7.4
76.2	0.0319	12.2

$^{51}\text{V}(p,p')$ $E^*=3.32$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.4	0.383	9.5
25.5	0.312	6.0
30.6	0.279	4.4
35.7	0.169	6.3
40.8	0.151	6.3
45.9	0.114	6.6
50.9	0.0874	6.5
61.1	0.0481	8.6
66.1	0.0227	16.0
71.2	0.0367	10.5

$^{51}\text{V}(p,p')$ $E^*=4.06$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
25.5	0.0882	32.9
30.6	0.0334	20.2
35.7	0.0601	34.1
40.8	0.0454	14.1
45.9	0.0297	19.0
51.0	0.0243	21.1
56.0	0.0242	13.6
61.1	0.0132	21.2
66.1	0.0105	44.4

$^{51}\text{V}(p,p')$ $E^*=4.28$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
15.3	0.200	39.2
25.5	0.115	10.8
30.6	0.0823	10.5
35.7	0.0836	9.4
40.8	0.0577	13.3
45.9	0.0279	26.0
51.0	0.0402	11.9
56.0	0.0306	11.6
61.1	0.0132	21.2
76.2	0.0148	42.6

$^{51}\text{V}(p,p')$ $E^*=3.78$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.4	0.504	8.3
25.5	0.654	3.7
40.8	0.403	3.4
45.9	0.229	4.3
51.0	0.157	4.7
56.0	0.185	3.9
61.1	0.149	4.6
66.1	0.121	4.8
71.2	0.109	6.5
76.2	.0581	13.6

$^{51}\text{V}(p,p')$ $E^*=3.91$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
11.2	1.429	34.5
15.3	0.569	27.6
20.4	0.379	11.0
25.5	0.350	5.4
35.7	0.136	17.5
45.9	0.0858	8.3
51.0	0.0943	6.5
56.0	0.0902	7.1
61.1	0.0414	9.2
66.1	0.0295	15.9
71.2	0.0151	19.0
76.2	0.0218	21.7

$^{52}\text{Cr}(p,p)'$, $E^*=0$, $J^\pi=0^+$

θ c.m. (deg.)	$\frac{d\sigma}{dw}$ (mb/sr)	Statistical Error (%)
15.3	2182.	1.6
20.4	647.	0.4
25.5	148.	0.3
30.6	25.8	0.4
35.7	120.	0.2
45.8	57.9	0.2
50.9	23.4	0.3
56.0	8.90	0.5
61.0	8.53	0.4
66.1	9.76	0.6
71.1	7.40	0.4
76.1	4.53	0.6
81.1	2.35	0.8

$^{52}\text{Cr}(p,p')$, $E^*=1.434$ MeV, $J^\pi=2^+$

θ c.m. (deg.)	$\frac{d\sigma}{dw}$ (mb/sr)	Statistical Error (%)
15.3	8.57	8.7
20.4	5.87	2.6
25.5	5.16	1.3
30.6	3.36	1.1
35.7	1.64	1.4
40.8	1.10	1.6
45.8	1.57	1.3
50.9	1.54	1.1
56.0	1.31	3.0
61.0	0.789	1.3
66.1	0.439	2.6
71.1	0.352	2.0
76.1	0.403	1.9
81.2	0.404	1.9

$^{51}\text{V}(p,p')$ $E^*=4.51$

θ (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.4	0.212	16.0
25.5	0.207	7.8
30.6	0.552	3.0
35.7	0.263	4.4
40.8	0.163	6.4
45.9	0.115	8.8
51.0	0.0853	6.9
56.0	0.0833	6.2
61.1	0.0821	7.7
66.1	0.0637	9.2
71.2	0.0657	8.7

$^{52}\text{Cr}(p,p')$; $E^*=2.965$ MeV, $J^\pi = 2^+$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
30.6	0.0292	14.3
35.7	0.0277	25.5
45.9	0.0301	16.6
50.9	0.0138	33.8
56.0	0.0196	11.7
61.0	0.0139	14.4
71.1	0.00267	52.6
81.2	0.00827	25.9

$^{52}\text{Cr}(p,p')$; $E^*=3.163$ MeV, $J^\pi = 2^+$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.4	0.651	9.9
25.5	0.633	4.0
30.6	0.372	3.4
35.7	0.262	4.1
40.8	0.162	6.1
45.9	0.223	4.2
50.9	0.243	3.1
56.0	0.213	3.1
66.1	0.0893	6.0
76.2	0.0642	5.1
81.2	0.0599	5.1

$^{52}\text{Cr}(p,p')$; $E^*=2.371$ MeV, $J^\pi = 4^+$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
15.3	1.37	40.0
20.4	0.648	10.3
25.5	0.454	4.7
30.6	0.434	3.1
35.7	0.471	2.8
40.8	0.352	3.2
45.8	0.340	3.1
50.9	0.244	3.0
56.0	0.175	3.5
61.0	0.129	3.3
66.1	0.121	5.1
81.2	0.0459	5.8

$^{52}\text{Cr}(p,p')$; $E^*=2.767$ MeV, $J^\pi = 4^+$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.4	0.658	10.5
30.6	0.402	3.2
35.7	0.444	2.8
40.8	0.360	3.4
45.9	0.319	3.2
50.9	0.200	3.4
56.0	0.141	3.9
61.0	0.107	3.8
76.2	0.0576	5.3

$^{52}\text{Cr}(p,p')$; $E^*=4.03$ MeV, $J^\pi=4^+$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
35.7	0.143	6.4
45.9	0.0852	8.2
50.9	0.0591	7.8
56.0	0.0426	8.0
61.1	0.0331	7.3
76.2	0.0372	7.2

$^{52}\text{Cr}(p,p')$; $E^*=4.59$ MeV, $J^\pi=3^-$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
35.7	2.15	1.3
40.8	1.56	1.3
45.9	1.03	1.7
50.9	0.736	1.7
56.0	0.675	1.8
76.2	0.278	2.3
81.2	0.188	2.8

$^{52}\text{Cr}(p,p')$; $E^*=3.472$ MeV, $J^\pi=4^+$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
25.5	0.127	10.4
30.6	0.0789	7.8
40.8	0.107	9.2
45.9	0.0887	7.6
50.9	0.0663	7.1
56.0	0.0516	6.8
76.2	0.0233	9.3
81.2	0.0174	11.3

$^{52}\text{Cr}(p,p')$; $E^*=3.772$ MeV, $J^\pi=2^+$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
15.3	3.02	54.6
20.4	2.02	5.1
25.5	1.35	2.6
30.6	0.820	2.3
35.7	0.455	2.9
40.8	0.289	3.8
45.9	0.324	3.3
50.9	0.342	2.6
56.0	0.264	2.8
61.1	0.139	3.4
66.1	0.0887	6.1
71.1	0.0733	4.7
81.2	0.109	3.7

$^{52}\text{Cr}(p,p')$; $E^*=5.12$ MeV, $J^\pi=4^+$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
35.7	0.128	8.7
45.9	0.119	7.6
51.0	0.0735	8.0
56.0	0.0690	7.5
61.1	0.0522	5.9
66.1	0.0441	8.6
76.2	0.0249	10.5
81.2	0.0188	11.3

$^{52}\text{Cr}(p,p')$; $E^*=5.30$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
35.7	0.180	6.3
40.8	0.0606	14.1
45.9	0.0583	11.8
51.0	0.0522	10.3
56.0	0.0574	8.3
61.1	0.0424	6.8
66.1	0.0452	8.8
76.2	0.0220	11.2
81.2	0.0222	9.6

$^{52}\text{Cr}(p,p')$ $E^*=5.48$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.4	0.440	15.2
25.5	0.420	5.6
30.6	0.457	3.4
35.7	0.447	3.3
40.8	0.436	2.8
45.9	0.347	3.3
50.9	0.247	3.3
56.0	0.222	3.4
61.1	0.153	3.4
66.1	0.149	4.7
71.1	0.120	3.8
76.2	0.106	4.0
81.2	0.00790	4.6

$^{52}\text{Cr}(p,p')$ $E^*=6.21$ MeV, $J^\pi=3^-$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
25.5	0.384	6.2
30.6	0.375	4.0
35.7	0.267	5.2
40.8	0.220	5.1
45.9	0.191	5.5
51.0	0.250	3.7
56.0	0.148	4.7
61.1	0.111	4.8
66.1	0.105	6.5
71.2	0.640	6.3
76.2	0.540	7.5
81.2	0.456	7.7

$^{52}\text{Cr}(p,p')$ $E^*=6.35$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
35.7	0.0910	12.2
40.8	0.1020	10.0
45.9	0.0861	9.5
51.0	0.0527	10.4
56.0	0.0334	23.4
66.1	0.0258	22.7
71.2	0.0148	23.8
76.2	0.0145	18.9
81.2	0.0194	13.0

$^{52}\text{Cr}(p,p')$ $E^*=6.60$ MeV, $J^\pi=3^-$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.4	0.685	11.2
25.5	0.843	3.8
30.7	0.724	2.7
35.7	0.480	3.4
40.8	0.308	4.0
45.9	0.201	5.5
51.0	0.148	5.5
56.0	0.140	5.0
66.1	0.114	6.5
71.2	0.0629	7.0
76.2	0.0332	10.8
81.2	0.0364	9.2

$^{52}\text{Cr}(p,p')$ $E^*=6.80$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
20.4	0.562	12.8
25.5	0.511	5.0
30.6	0.347	4.4
35.7	0.205	5.9
45.9	0.124	7.3
51.0	0.101	6.4
66.1	0.0675	9.3
71.2	0.0357	10.5
76.2	0.0309	13.3
81.2	0.0268	11.8

$^{52}\text{Cr}(p,p')$ $E^*=7.03$ MeV, $J^\pi=3^-$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
40.8	0.339	3.9
45.9	0.272	4.1
51.0	0.171	4.8
56.0	0.172	4.6
61.1	0.142	4.6
71.2	0.0630	7.0
76.2	0.0548	10.0
81.2	0.0441	9.4

$^{52}\text{Cr}(p,p')$ $E^*=7.47$ MeV

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
35.7	0.108	12.9
45.9	0.0760	13.3
51.0	0.0627	20.7
56.0	0.101	7.0
61.1	0.0477	10.3
66.1	0.0646	11.4
71.2	0.0359	10.8
81.3	0.0241	14.8

$^{52}\text{Cr}(p,p')$ $E^*=7.73$, $J^\pi=3^-$

θ c.m. (deg.)	$\frac{d\sigma}{d\omega}$ (mb/sr)	Statistical Error (%)
25.5	0.357	7.2
30.6	0.301	5.0
35.7	0.296	5.7
40.8	0.195	5.8
45.9	0.114	22.1
51.0	0.0885	21.0
56.0	0.0925	7.1
61.1	0.110	5.2
71.2	0.0568	8.0
76.2	0.0221	30.1

