

POLARIZATION AND DEPOLARIZATION IN pn -AND pp -SCATTERING AT 635 MeV

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Hitherto, the polarization in free pp - and quasi-elastic pn - and pp -scattering has been measured by means of scintillation counters in the angular range of $18.5-145.7^\circ$ CM, and the depolarization parameter in the same scattering processes has been determined at an angle of 112.3° CM. For this purpose use was made of a proton beam with a degree of polarization P_1 equal to 0.515 ± 0.014 . The protons were scattered on CD_2 -, CH_2 - and C-targets.

The angular resolutions in the polarization and depolarization measurements amounted to ± 1.3 and $\pm 2^\circ$ LAB, respectively. The results of the measurements for depolarization and polarization are given respectively in Tables 1 and 2,* where $e_1 = P_1 P_1$; $e_2 = P_1 P_2$; $e_3 = P_1 P_3$; e_2 is the asymmetry of double scattering; P_2 is the polarization produced in pn (pp)-scattering; P_3 is the analyzing

Table 1.

Parameter	Quasi-elastic		Free pp -scattering
	pn -scattering	pp -scattering	
D	0.51 ± 0.39	0.67 ± 0.10	0.76 ± 0.08
e_{3n}	-0.086 ± 0.089	-0.024 ± 0.017	-0.007 ± 0.009
e_2	-0.166 ± 0.018	-0.146 ± 0.008	-0.150 ± 0.008
e_3	—	0.194 ± 0.010	—
e_1	—	0.189 ± 0.014	—

* The polarizations given in Table 2 should be multiplied by 1.18 ± 0.10 .

Table 2.

Angle CM	Quasi-elastic		Free pp -scattering
	pn -scattering	pp -scattering	
18.5	0.241 ± 0.046	—	0.250 ± 0.032
34.5	0.303 ± 0.036	0.353 ± 0.026	0.391 ± 0.020
45.7	0.200 ± 0.025	0.418 ± 0.026	0.396 ± 0.024
56.7	0.082 ± 0.025	0.357 ± 0.012	0.371 ± 0.020
67.3	0.040 ± 0.017	0.290 ± 0.021	0.284 ± 0.021
90.0	-0.222 ± 0.030	-0.008 ± 0.020	0.027 ± 0.012
112.5	-0.323 ± 0.034	-0.278 ± 0.014	-0.300 ± 0.014
134.3	-0.258 ± 0.029	-0.378 ± 0.017	-0.404 ± 0.016
145.7	-0.176 ± 0.058	—	-0.337 ± 0.034

power of a beryllium target; e_{3n} is the measured asymmetry of triple scattering.

A comparison of the results obtained here with those of [1-3] shows that the polarization and depolarization in quasi-elastic pp -scattering differs only slightly from the same parameters in free pp -scattering. Thus, it may be hoped that the polarization and depolarization found by these authors for quasi-elastic pn -scattering differ only slightly from the respective quantities for free pn -scattering.

REFERENCES

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