Université Scientifique et Médicale de Grenoble

INSTITUT DES SCIENCES NUCLEAIRES DE GRENOBLE

53, avenue des Martyrs - BP 257 - 38044 Grenoble Cedex
Tel. 87 71 41

Laboratoire associé à l'Institut National de Physique Nucléaire et de Physique des Particules

[illegible]

2. [illegible]

The measurements w[illegible] at the [illegible] cyclotron. The ^{20}Ne angular distributions were [illegible] Ca target, at 75 MeV on Ca, Fe, Ge; at 95 MeV [illegible] Fe, G[illegible] and at [illegible] MeV on Sn. Self-supporting natural targets of [illegible] for Ca and Fe whereas 70 μg/cm^2 [illegible] of ^{70}Ge and ^{120}Sn were deposited onto [illegible] cm^2 [illegible]. The ^{20}Ne incident ions were of charge state 4^+ for [illegible] MeV [illegible]. When the charge state 5^+ was used for ^{20}Ne ions, ^{16}O ions of charge state 4^+ having the same magnetic rigidity were [illegible] in the [illegible] beam. Because the energy spectra of the [illegible] the ^{16}O group well separated from the ^{20}Ne one, [illegible] simultaneously

[illegible]

[illegible] ... fig. 1 [illegible] ... and [illegible] ... zation [illegible] which is [illegible]

3. OPTICAL [illegible]

The optical model calculations were [illegible] SPI code [6]), using a four-param[illegible] potential

$$U(r) = V_c - (V + iW)/\left[1 + \exp\frac{r - r_o(\ldots)}{a}\right],$$

where V_c is the Coulomb potential of a uniformly [illegible] the same radius as the complex nuclear [illegible].

[illegible]

[illegible] $r_0 = 1.24 \pm 0.04$ [illegible] the [illegible] are [illegible] from the [illegible].

[illegible] were [illegible] r_0 and a_r [illegible] W [illegible] MeV for ^{16}O and [illegible] χ^2 [illegible] parameter search [illegible] differed from [illegible] of the first step [illegible] less than 20 [illegible]. Are reported in [illegible] r_0 and [illegible] values are approxima[illegible] [illegible] It could be noted that for [illegible] the optimum r_0 is greater than r_0, the optimum a_r is [illegible] than a_0 and vice versa. No [illegible] dependence was clearly observed. The barrier heights V_b deduced from the real potentials are shown in fig. 3. For some projectile-target combinations, V_b was available at two energies but the values being very close to each other, their mean value was then plotted. The [illegible] variation of V_b in fig. 3 could be understood simply. In the vicinity of the interaction [illegible] since the real nuclear potential is

$$V_R = \mathrm{Re}\, U(r) \approx -V_0 \exp\frac{r - r_0(A_1^{1/3} + A_2^{1/3})}{a},$$

the barrier [illegible] is then

[illegible]

5. [illegible]

[illegible] ^{16}O and ^{20}[illegible] were well described by [illegible] imaginary [illegible] to real [illegible] ^{20}[illegible] for ^{16}O, [illegible] so that good fits could still be [illegible] the depths V and W being fixed. The [illegible] had a quasi-linear variation in terms of the parameter $Z_1 Z_2 / (A_1^{1/3} + A_2^{1/3})$ in agreement with previous results.

The authors wish to thank [illegible] for his participation in a portion of the [illegible] research.

5) [illegible]

[illegible]

[illegible]

[illegible]

6) [illegible]

7) [illegible]

8) [illegible] Williams, R.H. Davis, C. [illegible] and

A.P. Zeller, Phys. Rev. [illegible]

[illegible]

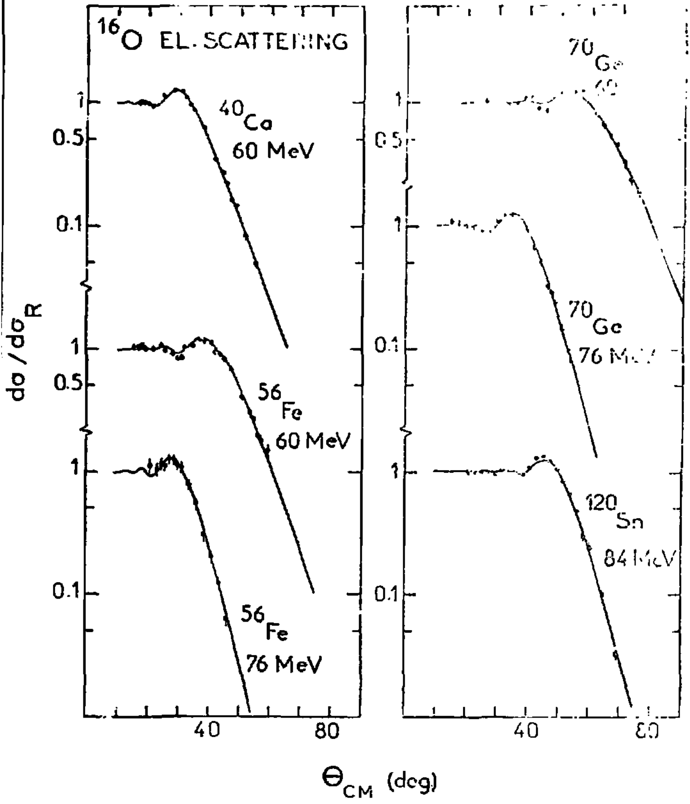
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	
		[illegible]	[illegible]	[illegible]	
	[illegible]	[illegible]	1,[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	1,[illegible]	[illegible]	[illegible]
^{20}Ne	[illegible]	[illegible]	1,[illegible]	[illegible]	[illegible]
		[illegible]	1,[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	1,[illegible]	[illegible]	[illegible]
		[illegible]	1,[illegible]	[illegible]	[illegible]
	^{70}Ge	[illegible]	1,1	0,[illegible]	[illegible]
		[illegible]	1,[illegible]	[illegible]	[illegible]
	^{120}Sn	[illegible]	1,[illegible]	[illegible]	[illegible]

[a]) with V = [illegible] MeV ; W = [illegible] MeV for ^{16}O [illegible] ^{20}[illegible]

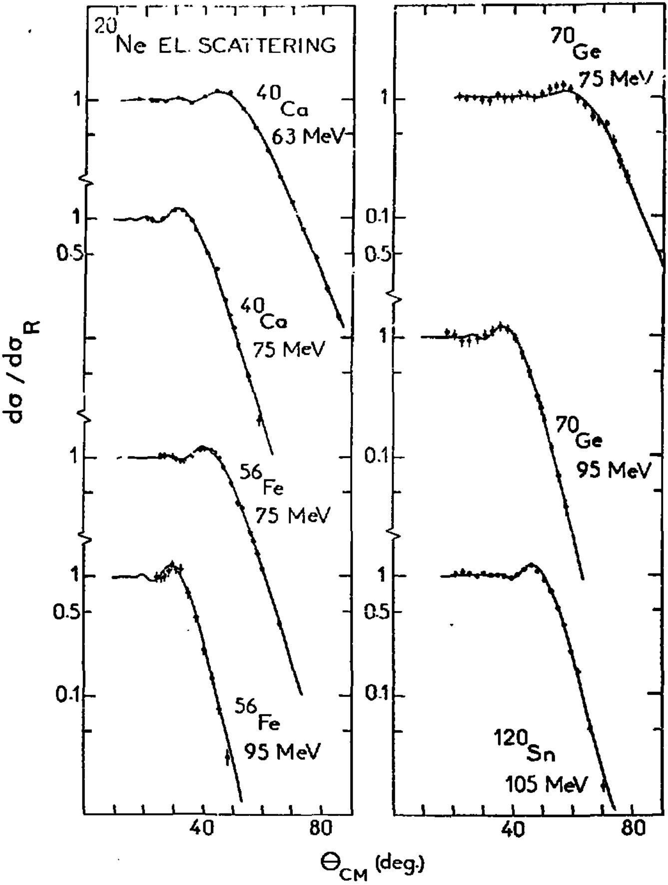
[illegible]

[illegible]

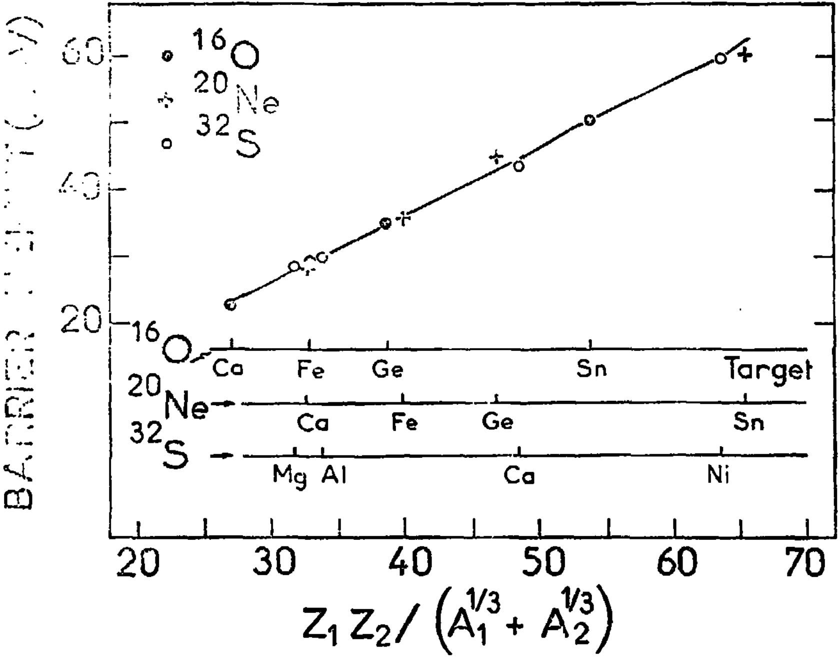
[illegible] three projectiles [illegible]



^{16}O EL. SCATTERING
^{40}Ca
60 MeV
^{56}Fe
60 MeV
^{56}Fe
76 MeV
^{70}Ge
^{70}Ge
76 MeV
^{120}Sn
84 MeV
dσ/dσ$_R$
1
0.5
0.1
40
80
Θ$_{CM}$ (deg)



20Ne EL. SCATTERING
40Ca 63 MeV
40Ca 75 MeV
56Fe 75 MeV
56Fe 95 MeV
70Ge 75 MeV
70Ge 95 MeV
120Sn 105 MeV
dσ / dσR
1
0.5
0.1
40
80
ΘCM (deg.)



16O
20Ne
32S
60
40
20
BARRIER
16O
Ca
Fe
Ge
Sn
Target
20Ne
Ca
Fe
Ge
Sn
32S
Mg
Al
Ca
Ni
20
30
40
50
60
70
$Z_1 Z_2 / (A_1^{1/3} + A_2^{1/3})$