

Web of Science

Search | Search Results | My Tools | Search History | Marked List

Full Text from Publisher | Look Up Full Text | Save to EndNote online | Add to Marked List

61 of 449

Regge pole analysis of elastic scattering of a particles by even isotopes of Ni target nuclei at incident energies above Coulomb barrier

By: **Badran, RI** (Badran, R. I.)^[1]; **Istaiti, AI** (Istaiti, A. I.)^[1,2]; **Mashaqbeh, WN** (Mashaqbeh, W. N.)^[1]; **Al-Lehyani, IH** (Al-Lehyani, I. H.)^[3]

INTERNATIONAL JOURNAL OF MODERN PHYSICS E-NUCLEAR PHYSICS

Volume: 24 Issue: 11

Article Number: 1550082

DOI: 10.1142/S0218301315500822

Published: NOV 2015

[View Journal Impact](#)

Abstract

Regge pole model is adopted to account for the angular distribution at backward angles for a set of elastic scattering processes of incident α -particles by different isotopes of nickel ions, Ni-58, Ni-60, Ni-62, Ni-64, at different laboratory energies above Coulomb barrier. The reproduction of cross-sections at backward angles is preceded by an attempt to fit the experimental data at forward angles of the scattering. Three-parameter McIntyre model which is based on concept of strong absorption parametrization of the scattering matrix elements, has been employed to analyze and reproduce the experimental data of angular distribution of different elastic scattering reactions at forward angles. The three parameters extracted from McIntyre model analysis are employed as fixed entries in the fitting process of the full angle-range of angular distribution where another four free parameters are employed using the Regge pole model. Diffractive features observed in the angular distributions are studied. The Fresnel-type diffraction pattern is found dominant for all investigated elastic scatterings where Coulomb interaction is strong. The interaction radius of elastic scattering is found decreasing and the total cross-section increasing when the incident projectile energy increases. Moreover, the interaction radius and total reaction cross-section are found increasing with the increase in the size of target ion. Such diffractive behavior is consistent with the prescriptions of strong absorption model (SAM). Furthermore, the explanation of the diffractive features of studied elastic scattering reactions is model-independent. The Regge pole analysis reveals the existence of a pole which has its location, width, amplitude and phase angle exhibiting a common peak at energy of 24.1 MeV with oscillatory behaviour at energies around this peak energy, for all elastic scattering of alpha particle on isotopes of Ni targets except that of Ni-58 target which exhibits extra peaks for energy larger than 24.1 MeV. We believe that the presence of poles is responsible for the oscillatory structure of the backward cross-sections. The variation of Regge pole parameters with both incident energy and size of target nucleus is illustrated.

Keywords

Author Keywords: Heavy-ion scattering; strong absorption model; McIntyre parametrization; Regge pole

KeyWords Plus: STRONG ABSORPTION MODEL; ALPHA-PARTICLES; DIFFRACTION SCATTERING; INELASTIC-SCATTERING; HEAVY-ION; ANGLE; REPRESENTATION; RESONANCE; MCINTYRE; RANGE

Author Information

Reprint Address: Badran, RI (reprint author)

+ Hashemite Univ, Dept Phys, POB 150459, Zarqa, Jordan.

Addresses:

+ [1] Hashemite Univ, Dept Phys, Zarqa, Jordan

[2] Zarqa Univ, Dept Phys, Zarqa, Jordan

+ [3] King Abdulaziz Univ, Dept Phys, Jeddah 21589, Saudi Arabia

Citation Network

3 Times Cited
35 Cited References
[View Related Records](#)
[Create Citation Alert](#)

(data from Web of Science Core Collection)

All Times Cited Counts

3 in All Databases
3 in Web of Science Core Collection
0 in BIOSIS Citation Index
0 in Chinese Science Citation Database
0 in Data Citation Index
0 in Russian Science Citation Index
0 in SciELO Citation Index

Usage Count

Last 180 Days: 1
Since 2013: 1
[Learn more](#)

Most Recent Citation

Badran, R. I. [Analysis of Elastic Scattering of He-4+Ni-58 and He-4+Ni-60 Using Semiclassical Models](#). PROCEEDINGS OF THE 6TH INTERNATIONAL ADVANCES IN APPLIED PHYSICS AND MATERIALS SCIENCE CONGRESS & EXHIBITION (APMAS 2016), 2017.

[View All](#)

This record is from:

Web of Science Core Collection
- Science Citation Index Expanded

Suggest a correction

If you would like to improve the quality of the data in this record, please [suggest a correction](#).

E-mail Addresses: rbadran@hu.edu.jo

Publisher

WORLD SCIENTIFIC PUBL CO PTE LTD, 5 TOH TUCK LINK, SINGAPORE 596224, SINGAPORE

Categories / Classification

Research Areas: Physics

Web of Science Categories: Physics, Nuclear; Physics, Particles & Fields

Document Information

Document Type: Article

Language: English

Accession Number: WOS:000365699200008

ISSN: 0218-3013

eISSN: 1793-6608

Journal Information

Table of Contents: [Current Contents Connect](#)

Impact Factor: [Journal Citation Reports](#)

Other Information

IDS Number: CX4VU

Cited References in Web of Science Core Collection: 35

Times Cited in Web of Science Core Collection: 3