

Atomic and isotopic changes induced by ultrasounds in iron

Gianni Albertini · Fabio Cardone · Monica Lammardo ·
Andrea Petrucci · Filippo Ridolfi · Alberto Rosada ·
Valter Sala · Emilio Santoro

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Abstract Electron microscopy and neutron activation techniques are used to map the elemental and isotopic compositions of ferrite bars where the emission of neutron bursts and the formation of dark regions were reported after ultrasound irradiation. Anomalous values are found in these regions. The original concentrations of natural isotopes of copper and zinc are deduced; the occurrence of pressure-induced nuclear reactions is inferred while the cavities are suggested to act as nuclear micro-reactors. The general characteristics of these phenomena are considered a support to the existence of a new type of reactions, called deformed space–time reactions (DST-reactions).

Keywords X-ray energy dispersive system analysis · Environmental scanning electron microscopy · Isotope determination · Neutron activation analysis · Ultrasounds · Piezonuclear reactions · Cu-Isotopes · Beta decay

Introduction

Pressure, either by ultrasound irradiation or by using industrial presses, has been reported to produce emission of nuclear particles [1–13]. These results are not easy to explain at the light of the scientific knowledge and technological experience so far commonly acquired, as the average density of the transferred energy (e.g., 0.1 MeV

G. Albertini
Dipartimento di Scienze e Ingegneria della Materia
dell'Ambiente ed Urbanistica (SIMAU), Università Politecnica
delle Marche (UNIVPM), Via Brece Bianche, 60131 Ancona,
Italy

G. Albertini (✉)
CNISM (Consorzio Nazionale Interuniversitario per le Scienze
fisiche della Materia), Ancona Unit, Ancona, Italy
e-mail: albertdom@vodafone.it; g.albertini@univpm.it

F. Cardone
Istituto per lo Studio dei Materiali Nanostrutturati (ISMN–CNR),
Via dei Taurini, 00185 Rome, Italy

F. Cardone · A. Petrucci
GNFM, Istituto Nazionale di Alta Matematica “F. Severi”,
Città Universitaria, P.le A.Moro 2, 00185 Rome, Italy

M. Lammardo · E. Santoro
Unità Tecnica Tecnologie e Impianti per la Fissione e la
Gestione del Materiale Nucleare (UTFISST), Laboratorio
Reattori Nucleari (REANUC), Ente Nazionale Energia e
Ambiente (ENEA), Via Anguillarese, 301, 00123 Rome, Italy

A. Petrucci
Ente Nazionale Energia e Ambiente (ENEA), Via Anguillarese,
301, 00123 Rome, Italy

A. Petrucci
CNR-ISMN National Research Council of Italy, Via dei Taurini,
00185 Rome, Italy

F. Ridolfi
Dipartimento di Scienze della Terra, della Vita e dell'Ambiente
(DISTEVA), Università degli Studi di Urbino “Carlo Bo”
(UNIURB), Campus Scientifico “Enrico Mattei” Via Cà Le
Suore 2, 61029 Urbino, Italy

A. Rosada
Unità Tecnica Tecnologie e Impianti per la Fissione e la
Gestione del Materiale Nucleare (UTFISST), Laboratorio
Caratterizzazione Materiali Nucleari (CATNUC), Ente
Nazionale Energia e Ambiente (ENEA), Via Anguillarese, 301,
00123 Rome, Italy

V. Sala
STARTEC ULTRASUONI Ltd Research Lab, Via Libero
Grassi, 1, 23875 Osnago, Lecco, Italy