



PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA
MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH
University of M'hamed Bougara of Boumerdes
Faculty of Science
Laboratory of Bioinformatics Research, Applied Microbiology,
and Biomolecule



National Seminar on Nanomaterials: Synthesis and Applications

NSN'24
5 and 6 June, 2024

CERTIFICATE OF PARTICIPATION

This certificate is awarded to

Blizak Salah

for his/her presentation of Abstract referenced bellow as

Poster in the NSN'24

Title: Review on Nanomagnetic Materials: Properties, Methods and Applications



President of the Scientific Committee

Scientific Committee Chair

of NSN'2024

Dr. TOUBANE Mahdia

President of the Organizing Committee

Organizing Committee Chair

of NSN'2024

Dr. BOUKHERROUB Nadia

الجمهورية الجزائرية الديمقراطية الشعبية
People's Democratic Republic of Algeria

M'hamed Bougara University of Boumerdes

Book of Abstract Proceeding NSN'24



National Seminar on Nanomaterials: Synthesis and Applications



Boumerdes, 5-6 Juine, 2024



Review on Nanomagnetic Materials: Properties, Methods, and Applications

Salah Blizak

Department of physics, Faculty of sciences, University Mohamed

Boudiaf of M'Sila, Algeria

Salah.blizak@univ-msila.dz

Abstract:

Nanomagnetic materials have emerged as a focal point of interdisciplinary research due to their unique magnetic properties and diverse applications across various fields. This review provides a comprehensive overview of nanomagnetic materials, encompassing their fundamental properties, synthesis methods, and practical applications. The intrinsic characteristics of these materials, such as high surface-to-volume ratios, superparamagnetism, and size-dependent magnetic behavior, are discussed in detail. Various synthesis techniques, including chemical vapor deposition, sol-gel processes, electrodeposition, and ball milling, are critically analyzed with respect to their advantages, limitations, and scalability. Furthermore, the review highlights the wide-ranging applications of nanomagnetic materials in data storage, biomedicine (e.g., drug delivery, hyperthermia, and imaging), catalysis, environmental remediation, and energy conversion/storage systems. Challenges associated with the stability, toxicity, and large-scale production of these materials are also addressed, along with potential strategies to overcome them. Finally, this review concludes by outlining future research directions aimed at advancing the design, fabrication, and utilization of nanomagnetic materials for emerging technologies.

Keywords : Nanomagnetic materials, magnetic properties, superparamagnetism, Nanomagnetic applications