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Mesoporous Silica

Mcm 41 Si Mcm 41

Chapter 2 Mesoporous Silica Mcm 41 Si Mcm 41

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Chapter 2

Mesoporous Silica

Mcm

CHAPTER 2:

MESOPOROUS SILICA

MCM-41 (Si-MCM-41)

2.1 Introduction

Microporous and mesoporous solids have found great utility as catalysts and

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sorption media

because of their large

internal surface area.

**CHAPTER 2:
MESOPOROUS
SILICA MCM-41 (Si-
MCM-41)**

Ordered Mesoporous
Silica (MCM-41 and

SBA-15) Chapter 2 .

Chapter 2 Manu V. 64

Ph. D. Thesis 2.1.

Introduction Tailoring
the surface of the
mesoporous silica
materials has a broad

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range of applications.

[1-4] Functional

organic compounds

(e.g. vinyl,

3-aminopropyl, phenyl,

thiol) [5-9] and

biomolecules (e.g.

cyclodextrin, peptides,

drugs) [10 ...

Chapter 2

This chapter illustrates

mesoporous silica and

organic-inorganic

hybrid materials, from

preparation to

application in fire

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retardancy of
polymeric materials. 41

Virgin and

functionalized

mesoporous silica

SBA-15 and MCM-41

are synthesized by

sol-gel technique and a

hydrothermal method.

Mesoporous Silica -

an overview |

ScienceDirect Topics

Direct synthesis of

various mesoporous

silica sieves using

cationic surfactants

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Mesoporous Silica

was first reported by scientists of Mobil Oil Research and Development in 1992 [12,13]. Among all mesoporous silica types, MCM-41 (obtained in basic media) and SBA-15 (obtained in acid media) became very important materials in many areas of science and engineering.

Mesoporous Silica - an overview |

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Mesoporous Silica
ScienceDirect Topics

2.3.2 Synthesis of
Mesoporous Silica 41

mesoporous silica

Mesoporous Silica

SBA-15 was prepared
via established

procedure (Vinu et al
2003, Sayari et al

2004). In brief, SBA-15
was synthesized using

the triblock copolymer
(P123). A typical

synthesis was

performed as follows: 4
g of P123 was

dispersed in 30 g of
water (H₂O) and 120 g

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Mesoporous Silica
of 2M hydro
Mcm 41 Si Mcm 41

**CHAPTER 2 A SINGLE
STEP SYNTHESIS OF
NANOCRYSTALLINE**

...

Herein, we present a novel chelating solid-phase, resulting from the functionalization of a mesoporous silica MCM-41, with the hydroxypyridinone N(3'-aminopropyl)-3-hydroxy-2-methyl-4-pyridinone (AHP) as the active site. The physico-

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chemical

characterization of the

new solid-state device,

...

**Development of a
sensor for trivalent
iron: AHP fixed on ...**

Chapter 2 Literature

Review micelles

(aspect ratio > 1.4) in

the range of 0.2-0.3 M,

which are then

removed by calcination

process to get ordered

mesoporous materials

[26]. 2.1.2 Mesoporous

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MCM-41 Si Mcm 41

Membranes The nanoporous membranes were synthesized by controlled hydrolysis and condensation reactions [27]. Various research groups have produced high quality

Chapter 2

Two ordered mesoporous silica samples with SBA-15-type and MCM-41-type structures were

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Mesoporous Silica

MCM-41

prepared with the methods described elsewhere [2, 3]. The surfactant in SBA-15 was removed by refluxing in ethanol for 8 hours in order to attain a large pore size while the surfactant in MCM-41 was burnt out at 550°C for 4 hours.

Ordered Mesoporous Silica - an overview | ScienceDirect Topics

Mesoporous Silica

Mesoporous silica (MS)

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Mesoporous Silica

Mcm 41

is a nanotechnological advancement, comprised of a honeycomb-like structure of silica, with a large number of empty channels (mesoporous) that entrap bioactive molecules; From: Nanobiomaterials in Galenic Formulations and Cosmetics, 2016

**Mesoporous Silica -
an overview |
ScienceDirect Topics**

Page 14/27

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Abstract. This chapter will show the general concepts of catalytic systems applied to reduction of atmospheric pollutants. The catalytic oxidation of volatile organic compounds (VOCs) is considered the most efficient strategy for the degradation to CO₂ and H₂O and H₂

Degradation of Volatile Organic Compounds with

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Catalysts ...

Mesoporous silica and

microporous (alumino)

silicates are used for

targeted delivery of

specific active agents

within specific

cancerous organs,

tissues, or cells (Arcos

and Vallet-Regi,

2013).The targeted

delivery can be

assured by molecular

nanogates which can

be activated by

external stimuli like

magnetic fields,

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MCM-48

ultrasound, or light but,
in certain cases, these
are not necessary
because ...

**Mesoporous Silica -
an overview |
ScienceDirect Topics**

Silica mesoporous

MCM-48, 15 μm

particle size, pore size

3 nm, Cubic pore

morphology : O 2 Si

pricing. 808989: Silica

mesoporous, 0.5 μm

particle size, pore size

~ 4 nm : O 2 Si pricing.

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900780 Silica

mesoporous SBA-15, 41

<150 μm particle size,
pore size 6 nm, amine
functionalized ...

Mesoporous

Materials -

Nanomaterials |

Sigma-Aldrich

Luigi Pasqua's 46

research works with

809 citations and 2,579

reads, including: Self-

assembly of Organic

Nanomaterials and

Biomaterials; The

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Bottom-Up Approach
for Functional
Mcm 41
Nanostructures ...

**Luigi Pasqua's
research works |
Università della
Calabria ...**

M. Jaroniec's 397
research works with
8,462 citations and
2,838 reads, including:
Analysis of carbon
materials porosity by
simultaneous use of
adsorption data for
nitrogen and carbon

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dioxide
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**M. Jaroniec's
research works |
Kent State
University, OH ...**

on the synthesis of
ordered mesoporous
silica fibers under non-
mixing conditions,
Chemistry of Materials,
to be submitted.

Chapter 4 Seshadri, S.
K., Alsyouri, H. & Lin, Y.
S (2010) Counter
diffusion self-assembly
synthesis of ordered

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mesoporous silica

membranes in straight

pore supports,

Microporous

Mesoporous Materials,

129, 228-237.

Synthesis and Characterization of Ordered Mesoporous Silica

Abdelhamid Sayari's

216 research works

with 16,725 citations

and 8,465 reads,

including: Covalently

Immobilized

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Mesoporous Silica
Polyethylenimine for
CO₂ Adsorption

**Abdelhamid Sayari's
research works |
University of Ottawa**

...

Unlike traditional porous silica, mesoporous silica exhibit exceptionally ordered pores. This arises from the nanotemplating approach applied during synthesis of these materials. Over

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the past 30 years, a
plethora of
mesoporous silica (SBA
15, SBA 16, MCM 41,
MCM 48, etc.) with a
wide range of pore
geometries
(hexagonal, cubic, etc.)
and ...

Mesoporous Silica and their Applications | Sigma- Aldrich

Mesoporous silica is a
mesoporous form of
silica and a recent

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development in nanotechnology. The most common types of mesoporous nanoparticles are MCM-41 and SBA-15. Research continues on the particles, which have applications in catalysis, drug delivery and imaging. A compound producing mesoporous silica was patented around 1970.

**Mesoporous silica -
Wikipedia**

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Mesoporous Silica

Mcm 41

of water in mesoporous silica or related materials³⁻⁶. ...

surface silanol groups are responsible for hydrophilicity of mesoporous MCM-41 materials. ... described in Chapter 2 with three different Si/Al ratios 52, 35 and 20 and are designated as Al-MCM-41 (52), Al-MCM-41 (35) and Al-MCM-41 (20) respectively. ...

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MCM-41

4 Chapter 4A: Hydrating Ability of MCM-41 Based on Thermal ...

This thesis involves synthesis, derivatization and biomedical applications of mesoporous silica nanoparticles (MSNs) based delivery systems. Chapter 1 introduces the background of MSNs including the advantages of MSNs, modification on MSNs

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MCM-41
for multifunctionality;
formation mechanism,
a typical synthesis
condition for MCM-41
and following
characterizations.

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ecf8427e.