

**FORMULATION AND EVALUATION OF MESOPOROUS
SILICA NANOPARTICLES LOADED ANTIARTHRITIC
GEL AS A TARGETED DRUG DELIVERY SYSTEM**

**फार्मूलेशन एंड इवैल्यूएशन ऑफ़ मेसोपोरोस सिलिका नैनोपार्टिकल्स लोडेड
एंटीअर्थरिटिक जेल एज अ टारगेटेड ड्रग डिलीवरी सिस्टम**

**A
Thesis**

**Submitted for the Award of the Ph.D. degree of
PACIFIC ACADEMY OF HIGHER EDUCATION AND
RESEARCH UNIVERSITY**

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2024

DECLARATION

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Date: / /2024

(DINESH DAYARAMJI CHAKOLE)

Signature of the Candidate

CERTIFICATE

It gives me immense pleasure in certifying that the thesis entitled “**FORMULATION AND EVALUATION OF MESOPOROUS SILICA NANOPARTICLES LOADED ANTIARTHRITIC GEL AS A TARGETED DRUG DELIVERY SYSTEM**” and submitted by **DINESH DAYARAMJI CHAKOLE** is based on the work research carried out under my guidance. He has completed the following requirements as per Ph.D. regulations of the University;

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DINESH DAYARAMJI CHAKOLE

Place: Udaipur

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TABLE OF CONTENTS

Sr. No.	Topics	Page No.
	<i>Declaration</i>	<i>ii</i>
	<i>Certificate</i>	<i>iii</i>
	<i>Certificate</i>	<i>iv</i>
	<i>Copyright</i>	<i>v</i>
	<i>Acknowledgement</i>	<i>vi</i>
	<i>Abstract</i>	<i>viii</i>
	<i>Table of Contents</i>	<i>ix</i>
	<i>List of Tables</i>	<i>xii</i>
	<i>List of Figures</i>	<i>xvi</i>
CHAPTER-1	INTRODUCTION	1 - 66
CHAPTER-2	REVIEW OF LITERATURE	67 - 77
CHAPTER-3	AIM AND OBJECTIVES	78 - 80
CHAPTER-4	PLAN OF WORK	81 - 82
CHAPTER-5	MATERIALS AND METHOD	83 - 127
CHAPTER-6	RESULTS AND DISCUSSION	128 - 174
CHAPTER-7	SUMMARY AND CONCLUSION	175 - 177
	Annexure:	
	Research Paper Publication	-
	Conference Certificates	-
	Plagiarism Report	-

LIST OF TABLES

Sr. No.	Table No.	Title of Tables	Page No.
1.	5.1	List of Chemicals	103
2.	5.2	List of Instruments	104
3.	5.3	Formulation of Antiarthritic Gel (with Drug-Loaded MSNs containing Tofacitinib Citrate and Methotrexate)	116
4.	6.1	Drug Loading Efficiency of both the drugs	136
5.	6.2	Cumulative Percentage Drug Release Profile for Tofacitinib Citrate and Methotrexate	137
6.	6.3	Formulation of Antiarthritic Gel (with Drug-Loaded MSNs containing Tofacitinib Citrate and Methotrexate)	141
7.	6.4	Variation of Drug-Loaded MSNs concentrations in Formulations	142
8.	6.5	Variation of Carbopol 940 concentration in Formulation	144
9.	6.6	Variation of Propylene Glycol concentration in Formulation	146
10.	6.7	Rheological parameters of Nanogel Formulation (F3)	149
11.	6.8	Initial Spreadability assessment readings of Nanogel Formulation (F3)	150
12.	6.9	Adjusted Spreadability assessment readings after decreasing viscosity	151
13.	6.10	Adjusted Spreadability assessment readings after increasing MSN concentration	152
14.	6.11	Texture analysis of the Nanogel Formulation (F3)	153
15.	6.12	Drug content uniformity in Formulation F3	154

16.	6.13	Particle Size and Size Distribution of Nanogel Formulation (F3)	155
17.	6.14	Zeta potential values of individual and combined drug from Nanogel Formulation (F3)	157
18.	6.15	<i>In- Vitro</i> Drug Release of Individual and Combined drugs from Nanogel Formulation (F3)	158
19.	6.16	<i>Ex-Vivo</i> Drug Release of Individual and Combined drugs from Nanogel Formulation (F3)	160
20.	6.17	Accelerated stability study of the formulation (at 40°C ± 2°C and 75% ± 5% RH)	161
21.	6.18	Long Term stability study of the formulation at (25°C ± 2°C and 60 % ±5% RH)	162
22.	6.19	Long Term stability study of the formulation at 4°C	163
23.	6.20	Cumulative percentage drug release from Nanogel Formulation (F3)	165
24.	6.21	Plasma concentration of drugs at different time intervals	166
25.	6.22	T _{max} of Methotrexate	167
26.	6.23	T _{max} of the Tofacitinib Citrate	168
27.	6.24	Summary of Dermatokinetic parameters of Nanogel Formulation (F3)	169
28.	6.25	Dermatokinetic diffusion of Methotrexate	171
29.	6.26	Dermatokinetic diffusion of Tofacitinib Citrate	171

LIST OF FIGURES

Sr. No.	Figure No.	Title of Figures	Page No.
1.	1.1	Types of Arthritis	04
2.	1.2	Socio-Economic factors of arthritis	06
3.	1.3	Nanoparticles used in arthritis	19
4.	1.4	Advantages of MSNs	30
5.	5.1	Franz Diffusion Cell	121
6.	5.2	Diffusion Cell Apparatus	122
7.	6.1	The Fourier-transform infrared (FT-IR) spectrum for the MSN's	130
8.	6.2	Transmission electron microscopy (TEM) photographs depict: (A) A honeycomb-like permeable framework of mesoporous silica nanoparticles. The spherical particles are depicted with hexagonal straight paths flowing from them. The particles possess linear, one-dimensional cylindrical pores. (B) An aerial perspective of the particles, revealing the channels arranged in a honeycomb structure.	131
9.	6.3	An image obtained using scanning electron microscopy (SEM) that displays the dimension as well as structure of mesoporous silica nanoparticles.	132
10.	6.4	DSC Thermogram of MSN	133
11.	6.5	(A) Surface examination using nitrogen adsorption isotherms that enables the computation of surface area using the BET method. (B) The size of the pores of the fragments was determined using the Barrett-Joyer-Halenda (BJH) method.	133

12.	6.6	FTIR spectra for unmodified and surface-modified mesoporous silica nanoparticles (MSNs)	134
13.	6.7	XRD spectra of surface modified mesoporous silica nanoparticles (MSNs)	135
14.	6.8	Cumulative Percentage Drug Release Drugs loaded Surface-Modified MSNs	138
15.	6.9	Combined Drug Release from different Formulation (Impact of Drug-Loaded MSNs concentrations in Formulations)	143
16.	6.10	Combined Drug Release from different Formulation (Impact of Carbopol-940 concentration in Formulation)	145
17.	6.11	Combined Drug Release from different Formulation (Impact of Propylene Glycol concentration in Formulation)	147
18.	6.12	Content Uniformity of Methotrexate and Tofacitinib citrate in different formulation Trials	147
19.	6.13	Rheological behavior of the Nanogel Formulation (F3)	149
20.	6.14	Initial Spreadability assessment readings of Nanogel Formulation (F3)	150
21.	6.15	Adjusted Spreadability assessment after decreasing viscosity of Nanogel Formulation	151
22.	6.16	Adjusted Spreadability assessment after increasing MSN concentration of Nanogel Formulation	152
23.	6.17	Hardness of the of Nanogel Formulation (F3)	154
24.	6.18	Contour plot of Particle Size and Size Distribution of Nanogel Formulation (F3)	155
25.	6.19	Particle size of Methotrexate (MTX), Tofacitinib Citrate (TC) and Combined (MTX+TC) from Nanogel Formulation (F3)	156

26.	6.20	Polydispersibility Index (PDI) of Methotrexate (MTX), Tofacitinib Citrate (TC) and Combined (MTX+TC) from Nanogel Formulation (F3)	156
27.	6.21	Zeta Potential of Methotrexate (MTX), Tofacitinib Citrate (TC) and Combined Drugs (MTX+TC) from Nanogel Formulation (F3)	157
28.	6.22	<i>In-Vitro</i> Drug Release of Methotrexate (MTX), Tofacitinib Citrate (TC) and Combined Drugs (MTX+ TC) from the Nanogel Formulation (F3)	159
29.	6.23	<i>Ex-Vivo</i> Drug Release of Methotrexate (MTX), Tofacitinib Citrate (TC) and Combined Drugs (MTX+ TC) from the Nanogel Formulation (F3)	160
30.	6.24	Cumulative Drug Release for Methotrexate (MTX), Tofacitinib citrate (TC) and Combined Drugs (MTX+TC) from Nanogel Formulation (F3)	165
31.	6.25	Plasma concentration of Methotrexate (MTX) and Tofacitinib Citrate (TC) at different time intervals	166
32.	6.26	Comparative Dermatokinetic Diffusion of Methotrexate and Tofacitinib citrate from the Nanogel Formulation (F3)	172
33.	6.27	Skin Diffusion of Methotrexate and Tofacitinib Citrate	173

ABBREVIATIONS

MSNs	:	Mesoporous Silica Nanoparticles
DMARDs	:	Disease-Modifying Antirheumatic Drugs
JAK	:	Janus Kinase
NSAIDs	:	Nonsteroidal Anti-Inflammatory Drugs
COX	:	Cyclooxygenase
AUC	:	Area under the Curve
MTX	:	Methotrexate
TC	:	Tofacitinib Citrate
TEM	:	Transmission Electron Microscopy
SEM	:	Scanning Electron Microscopy
BET	:	Brunauer-Emmett-Teller
CAS	:	Chemical Abstracts Service
BP	:	British Pharmacopoeia
TEA	:	Triethanolamine
API	:	Active Pharmaceutical Ingredient
GRAS	:	Generally Recognized as Safe
EDTA	:	Ethylenediaminetetraacetic Acid
PG	:	Propylene Glycol
DMSO	:	Dimethyl Sulfoxide
KBr	:	Potassium Bromide
TEOS	:	Tetraethyl Orthosilicate
FTIR	:	Fourier Transform Infrared Spectroscopy
DLS	:	Dynamic Light Scattering
APTES	:	3-Aminopropyltriethoxysilane
PBS	:	Phosphate-Buffered Saline
pXRD	:	Powder X-ray Diffraction

C _{max}	:	Maximum Concentration
T _{max}	:	Time to Reach Maximum Concentration
PDI	:	Polydispersity Index
APTES	:	3-Aminopropyltriethoxysilane
K _a	:	Absorption Rate Constant
K _e	:	Elimination Rate Constant
t _{1/2}	:	Half-Life
CFU	:	Colony-Forming Unit