3.3.1: Number of research papers per teachers in the Journals notified on UGC website during the last five years

TABLE 1 :LIST OF PUBLICATION IN 2022

Sr No	Title of the paper	Name of the authors	Department of the teacher	Name of Journal	Year of Publication	ISSN Number	Link of the website of the journal	Link to article/paper/abstract of the article
1	Review article on the plant avena sativa	Mrs Manasi Khadanga	PharmaCology	Journal of Positive School Psychology	2022	2717-7564	https://www.journalppw.com	https://journalppw.com/index.php/jpsp/article/view/4910
2	Review article on the plant avena sativa	Dr Sangram Kesari Panda	Pharmacognosy	Journal of Positive School Psychology	2022	2717-7564	https://www.journalppw.com	https://journalppw.com/index.php/jpsp/article/view/4910
3	Review article on the plant avena sativa	Mr.Aswini Kumar Sethi	Pharmaceutics	Journal of Positive School Psychology	2022	6973-6979	https://journalppw.com/	https://journalppw.com/index.php/jpsp/article/view/4910
4	Specialised Coating Processes Finding Pharmaceutical Applicability	Dr Prithwiraj Mohapatra.	Pharmacognosy	Journal of Drug Delivery & Therapeutics	2022	2250-1178	https://jddtonline.info/	https://jddtonline.info/index.php/jddt/article/download/5133/4221

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5	Development and evaluation of oroDispersible tablets of ethacrynic acid byUsing co-processed super disintegrates	Mrs Pragya Rani Patro	Pharma Analysis	Neuro Quantology	2022	1303-5150	https://neuroquantology.com/index.php	https://www.neuroquantology.com/data-cms/articles/20220831095512pmNQ33303.pdf

TABLE 2 :LIST OF PUBLICATION IN 2021

Sr No	Title of the paper	Name of the authors	Department of the teacher	Name of Journal	Year of Publication	ISSN Number	Link of the website of the journal	Link to article/paper/abstract of the article
1	Rp-hplc method development and estimation of rosiglitazone maleate in bulk and tablet dosage form	Mr Sujit Kumar Martha	Pharma Cology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2021	2277–4998	https://ijbpas.com/	https://doi.org/10.31032/IJBPAS/2021/10.9.5604

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2	A comprehensive study of medicinal plants with Antidiabetic Properties	Mr.Aswini Kumar Sethi	Pharmaceutics	Journal of Pharmaceutical Research International	2021	ISSN: 2456-9119	https://journaljpri.com/	https://journaljpri.com/index.php/JPRI/article/view/31799
3	Thermo-Mechanical Dry Coating as Dry Coating Process is for Pharmaceuticals.	Dr Mahammed Athar Alli Saikh	Pharmaceutics	Journal of Drug Delivery & Therapeutics	2021	ISSN -2250-1177	https://jddtonline.info/	https://jddtonline.info/index.php/jddt/article/download/5107/4217
4	Thermo-Mechanical Dry Coating as Dry Coating Process is for Pharmaceuticals.	Dr Prithwiraj Mohapatra.	Pharmacognosy	Journal of Drug Delivery & Therapeutics	2021	ISSN -2250-1177	https://jddtonline.info/	https://jddtonline.info/index.php/jddt/article/download/5107/4217
5	Specialised Coating Processes Finding Pharmaceutical Applicability	Dr Mahammed Athar Alli Saikh	Pharmaceutics	Journal of Drug Delivery & Therapeutics	2021	ISSN -2250-1177	https://jddtonline.info/	https://jddtonline.info/index.php/jddt/article/download/5133/4220

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TABLE 3 :LIST OF PUBLICATION IN 2019

Sr No	Title of the paper	Name of the authors	Department of the teacher	Name of Journal	Year of Publication	ISSN Number	Link of the website of the journal	Link to article/paper/abstract of the article
1	Development and evaluation of nanoemulsion gel for transdermal delivery of valdecoxib	Vikram V.B.K. Mishra	Pharmaceutics	Research Journal of Pharmacy and Technology	2019	0974-360X (Online) 0974-3618 (Print)	https://rjptonline.org/	https://rjptonline.org/AbstractView.aspx?PID=2019-12-2-26
2	Development and evaluation of nanoemulsion gel for transdermal delivery of ketoprofen	Vikram V.B.K. Mishra	Pharmaceutics	International Journal of Pharmaceutical Sciences Review and Research	2019	ISSN 0976 – 044X	http://www.globalresearchonline.net/	https://www.globalresearchonline.net/pharmajournal/vol56iss2.aspx
3	Formulation development of immediate release solid dispersion tablets of Lovastatin with Enhanced Dissolution	Mrs Suchismita Pani	Pharmaceutics	Research Journal of Pharmacy and Technology	2019	0974-360X (Online) 0974-3618 (Print)	https://rjptonline.org/	https://doi.org/10.5958/0974-360X.2019.00861.8

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http://journalppw.com

REVIEW ARTICLE ON THE PLANT AVENA SATIVA LINN

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Abstract

Avena sativa, sometimes known as oat, is a plant that belongs to the Poaceae family. Third in importance after wheat and corn in the United States, and fourth in importance worldwide. As far as nutrition is concerned, they are one of the most widely produced plants. Moreover, it is commercially nutritious. Soluble dietary fibre can be found in oat grain, oat bran, and oatmeal known as -glucan, which can lower total cholesterol and low–density lipoprotein cholesterol levels in the blood. Lipoprotein cholesterol is also useful for controlling blood sugar levels. Experiments of many kinds Oat has been proven in tests to be a possible agent for preventing the onset and progression of cancer , intestinal malfunction, obesity, celiac disease, and other disorders This examination will Avena sativa's therapeutic and utilitarian characteristics are discussed.The functional and therapeutic aspects of Avena sativa will be discussed in this review. However, due to the large number of the health benefits they provide, their intake has raised significantly, and they have become more popular come to the foreground immediately.

Keywords: Apoptotic, Avena Sativa, Anthranilic acid, B-glucan, Cholesterol.

1. INTRODUCTION

As per today's demand of society "food" how we can treat this like medicine is the common oath for all survivals. To satisfy these words "Avena Sativa Linn" is a best choice. It is difficult to find from what period of time Avena Sativa has been used medicinally for the betterment of people forums. Probably the generating of this plant is from Asia proxima. The green herb Oats were already proceeds in to cultivation from 4000 years ago. Demanded scientists like "Hippocrates and Plinius" recommended oats for feeding and medicinal properties. In case of antidepressive or thymoleptic disorders, liquid mixtures in proportion of 1:1 in 25% alcohol and tinctures in proportion of 1:5 in 45% alcohol produced a magical effect, as has been suggested by The British Herbal Pharmacopoeia (1976) and Hansel et al (1992).. The mother tincture of freshly young flower can treat sleeplessness, weakness, hysteria. Fresh tincture of oats preferably used in alcoholism and opiumdetoxification. Avena Sativa is high in protein, minerals, lipids, β- glucan, avenanthramides, lipids and sterols. In both of the plat form of therapeutic and non therapeutic consideration it is widely triggered for its significant value. It's extract is having various combination and numerous medicinal properties that's the reason for quantifying the demand for further studies and research work to expose it' s versatile properties[3].The most common use of A.S is livestock feeding. Primary cereal crops such as wheat and barley are usually considered secondary crops, as they are derived from undesirable weeds.[1,2]

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DEVELOPMENT AND EVALUATION OF ORO DISPERSIBLE TABLETS OF ETHACRYNIC ACID BY USING CO-PROCESSED SUPER DISINTEGRATES

Pragya Rani Patro[1], Chandan Nayak[2], Chandragiri Anil Kumar*[3], Padmini kanhar[4], J. Rajkumar[5], Konatham Teja Kumar Reddy[6]

Abstract

This study has established effective dispersion of ethacrynic acid by using co-processed super disintegrants. Co-processed super disintegrants consisting of cross povidone and sodium starch glycollate exhibited good flow and compression characteristics, quick disintegration, and improved drug dissolution. Hence, "patient-preferable and convenient dosage form," especially for pediatric and geriatric patients, does not need water to swallow, as it was concluded that First pass metabolism is reduced, thus offering improved bioavailability and reduced dose and side effects. F13 was the best among all formulations considering all pre and post-evaluation parameters.

KeyWords: Ethacrynic acid, disintegrants, co-processed, dosage form.

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Review Article

Specialised Coating Processes Finding Pharmaceutical Applicability

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Abstract

The manuscript aims at furnishing comprehensive information pertaining specialised coating technology/ processes. Solid dosage forms and solid particulates (SDFSP) are the major contributing group in the solid pharmaceuticals (SoPs). SDFSP exhibit peculiar physico-chemical properties and interaction behaviour which create problems/ issues during their handling, processing, storage, and use. Modifying and/or engineering surface attributes of SDFSP are advocated as powerful tool to modify their interaction behaviour and realise their worthy applications and functionalities. In this regard coating their surfaces with coating material (CM) is novel approach. Said approach involves wet and dry process for realising deposition of CM onto the surface of SDFSP substrates. Both the processes modify and/or alter innate properties of SDFSP substrates either physically or chemically. Basing on involved wet or dry process the coating method is either dry coating method (DCM) or wet coating method (WCM). Accordingly nowadays there available number of specialised devices, that bases on diverse technologies. Amongst them some involves state-of-art process/ technology like Supercell coating technology (SCT), Chemical vapour deposition (CVD), Atomic/molecular layer deposition (AMLD), Electrostatic deposition, Thermo-mechanical process, Resonant acoustic technology, Fluidised-bed process, Supercritical fluid (SCF) technology, and others. These foundational for commercially availability of specialised equipments like Magnetically Assisted Impaction Coater (MAIC), Resodyn acoustic mixer, Hybridizer®, Theta-composer®. Mechanofusion®, and others. Working and working principle, applicability, benefits, pros and limitations of specialised coating processes and technologies are herein discussed and presented. Contained information hoped to be beneficent for pharmaceutical professionals and technocrats and professionals of allied field.

Keywords: Coating, composite product, modification, specialised, surface.

INTRODUCTION

SDFSP are the most popular one, as drug delivery systems/ carriers [1, 2]. In most of pharmaceutical processes/ operations that deals SoPs, the SDFSP exhibit peculiar physico-chemical properties and interaction behaviour [2, 3]. These issues create problems during their processing, storage, use, and handling [3, 4]. Scientific finding is that said issues are contributed from the surface and surface attributes of the SDFSP, in most instances [2]. Thus handling of said issues is most inevitable [1, 3].

Modifying and/or characterising surface energy/ attributes of SDFSP are doubtlessly powerful tool to modify and/or characterise their interaction behaviour [1, 3, 4]. In this area, pharmaceutical technocrats and researchers are working extensively [1, 3]. They are mostly engaged in modifying SDFSP's interaction behaviour and/or finding their worthy applications and functionalities; for taking assorted advantage [1, 3, 5]. In this regards, they are exploiting numerous elegant strategies/ engineering methods to modify SDFSP's surface and/or surface attributes [1-3]. Among the available diverse strategies/ methods, these technocrats and researchers are considering coating as powerful, elegant, and efficient tool/ methodology [1, 3].

In pharmaceutical field, modification of surface and/or surface attributes of SDFSP thru coating their surfaces with an appropriate additive is extensively exploited, nowadays [1-3]. This strategy is nowadays becoming vital and used extensively for active(s) that are difficult to formulate [1, 3]. Herein coating is used for modifying/ altering innate properties of the SDFSP either physically or chemically [1-3].

Most of techniques/ process for surface modifications/ alterations of SoPs are frequently for functional and/or protective (non-functional) purposes [1, 3, 4]. These purposes includes changes in visual attributes, improved appearance, enhanced mechanical properties, masking of obnoxious odour and taste, stabilisation and improved stability, and defined drug release profile in the biological system [1-3].

Surface modification/ engineering process for SoPs thru coating are of diverse type and origin; refer Figure-1 [1, 3, 6, 7]. Wide diversity of the coating process/ methodologies is inherited with complex processing steps and with complexity of diverse origin and type [1, 3, 8]. Discussing all of them, a vast area and versatile field, is an immense task and out of scope of this manuscript [4, 9].

Content of manuscript is discussion and outline on recent development of specialised coating process/ techniques along with their applicability for SDFSP [1-3]. Presented information will increase visibility of specialised coating processes. This will resulting better understanding of

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RP-HPLC METHOD DEVELOPMENT AND ESTIMATION OF ROSIGLITAZONE MALEATE IN BULK AND TABLET DOSAGE FORM

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ABSTRACT

A simple and accurate RP-HPLC method has been developed for the estimation of Rosiglitazone Maleate (RGZ) in tablet pharmaceutical dosage form using 100; C_{18} (250 x 4 mm, 5µm) column with mobile phase comprising of acetonitrile: 0.01M ammonium acetate in the ratio 50:50 v/v. The flow rate was 1.0 ml/min and detection was carried out by UV-PDA detector at 245nm. The retention time for RGZ was found to be 3.008min. The linearity range, correlation co-efficient and accuracy of RGZ was found to be 01-200 µg/ml, 0.9992 and 99.75 – 105.3% respectively. The developed method was found to be simple, precise and accurate for the estimation of RGZ in tablet formulations.

Keywords: Rosiglitazone Maleate, RP-HPLC, tablet pharmaceutical dosage form, method development, validation

1. INTRODUCTION

Rosiglitazone Maleate (RGZ) is an antidiabetic drug in the thiazolidinedion class for oral administration **[1]**. RGZ is chemically (±)-5-{*p*-[2-(Methyl-2-pyridylamino) ethoxy]benzyl}-2,4-thiazolidinedione maleate. Structure shown in (**Figure 1**).

RGZ acts as a highly selective and potent agonist at peroxisome proliferator activated receptors (PPAR) in target tissues for insulin action on skeletal muscle, adipose tissue and liver. PPAR-gamma receptor activation controls the transcription of insulin-

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A Comprehensive Study of Medicinal Plants with Antidiabetic Properties

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Authors' contributions

This work was carried out in collaboration among all authors. Authors FA and RA designed the study, download articles, and wrote the first draft of the manuscript. Authors MI and RB managed the analyses of the study. Authors MIJ and AKS managed the literature searches and update the manuscript. All authors read and approved the final manuscript.

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Review Article

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ABSTRACT

The purpose of this research is to assess the anti-diabetic effects of several medicinal herbs. Herbal medicine has grown in popularity in both developing and developed countries over the last several years, owing to its natural origins and lack of negative effects. Even though medicinal plants have been utilized to treat diabetes mellitus from ancient times, they have been offered as abundant but untapped prospective sources for anti-diabetic medicines. It's a reality that diabetes can't be cured, and no one has ever claimed to be completely free of the disease. Diabetes mellitus is becoming a severe hazard to human health in all regions of the world due to its fast growing occurrence. Furthermore, several novel bioactive compounds derived from plants have demonstrated antidiabetic action with greater efficacy than oral hypoglycemic medicines already utilized in clinical therapy in recent years. Despite the fact that many plants are recommended, further pharmacological and chemical study is needed to fully understand the mechanism of hypoglycemic action.

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Journal of Drug Delivery and Therapeutics

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Review Article

Thermo-Mechanical Dry Coating as Dry Coating Process is for Pharmaceuticals

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Abstract

The manuscript aims to provide glimpse on updated information relating thermo-mechanical dry coating processes (TMDCP) suiting in modifying surface attributes of fine and ultra-fine particle (FiUlFiP). FiUlFiPs are the integral component of pharmaceutical processes. They exhibit complex and queer properties, are conferred mostly from their surface attributes colligated with their higher surface area. Particle engineering technocrats extensively working for modifying surface & surface attributes of FiUlFiPs. These efforts are to find their worthy applications & new functionalities. Among available diverse particle engineering technologies/ process, TMDCP, a dry coating process (DCP), advocated being worthy and efficient. The TMDCP finds multidisciplinary applications, mostly in drug development & drug delivery. Said DCP involves fixing and/or attaching coating material (CoM) as particles herein synonym guest particle (GP) onto core/substrate particle (CSP) herein synonym host particle (HP). Attaching/ fixing the GPs onto HPs, in TMDCP, involve their mechanical and/or thermal interactions. Scientific literatures are evidencing diverse techniques and/or process, basing on discussed interactions. Amongst them novel techniques/ processes are Hybridization, Magnetically assisted impaction coating process (MAICP), Mechanofusion, Theta-composer, and high shear compaction. In this area diverse devices/ equipments are prevailing in market. Important are Hybridizer, Magnetically assisted impaction coater (MAIC), Theta-composer, Mechanofusion, Quadro Comil®, Cyclomix®, and many others. Attempt of this article is to discuss and present their method of working, working principle, applicability, limitations, and benefits. Contained information might be beneficial for professionals of pharmaceutical and allied field.

Keywords: dry coating, equipment, particles, processes, thermo-mechanical.

INTRODUCTION

Amongst the diverse pharmaceutical products solid dosage forms are the most popular one [1, 2]. In their manufacturing the most basic unit is FiUlFiPs whose handling is most inevitable [2, 3]. Further these possess extremely cohesive bulk flow and often tend to agglomerate [1-3].

High surface area of FiUlFiPs is reasoning for receiving interest [1, 2, 4]. Researchers (scientists and engineers) in pharmaceutical sectors working extensively in finding applications and taking advantage of many worthy properties and new functionalities attributed to FiUlFiPs, as drug delivery system/carriers [1, 2, 5]. They were exploiting numerous elegant strategies of particle engineering methods to modify density and/or shape of FiUlFiPs to resolve the problems caused by cohesion and find their worthy properties and new functionalities [1-3]. The surface modification strategy of FiUlFiPs is nowadays becoming vital in pharmaceutical sector for the active(s) that are difficult to formulate [1-3].

Modification of surface and surface attributes of FiUlFiPs can be achieved by coating/depositing an appropriate additive on their surfaces [1-3]. The processes of coating/ deposition, by method of either physical deposition or chemical deposition, is for modifying surface attributes of FiUlFiPs are complex one [4, 6-8]. Physical deposition method uses thermal, mechanical, thermo-mechanical, electro-mechanical, or thermodynamic means to produce a thin film of solid at surface of FiUlFiPs [1-3, 7, 8]. Chemical deposition methods involve occurring of chemical changes of a fluid precursor at surface of FiUlFiPs, leaving a solid-layer of coating [6, 7]. Examples are Photo curable coating or photo-curing, gas/vapour phase deposition (like chemical vapour deposition, Atomic/molecular layer deposition) [1, 2]. All these DCP basically comprises of layering/deposition of CoM particles, coalescence and sintering, and levelling [3, 7, 8]; refer Figure-1.

Most of techniques/ process for surface modifications of FiUlFiPs alter their innate properties either physically or chemically [1, 2]. Technologies of them involve use of high pressures, high shear, elevated temperatures, and/or solvents [2, 3]. Solvent based wet coating methods have become less preferable as can reduce stability, cause particle agglomeration, leave residual organic solvents, and environmental concerns, arousing from unwanted waste streams and possible emissions of volatile organic solvents [2, 4, 6-8]. The strategies involving chemical deposition inherit

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Review Article

Thermo-Mechanical Dry Coating as Dry Coating Process is for Pharmaceuticals

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Abstract

The manuscript aims to provide glimpse on updated information relating thermo-mechanical dry coating processes (TMDCP) suiting in modifying surface attributes of fine and ultra-fine particle (FiUlFiP). FiUlFiPs are the integral component of pharmaceutical processes. They exhibit complex and queer properties, are conferred mostly from their surface attributes colligated with their higher surface area. Particle engineering technocrats extensively working for modifying surface & surface attributes of FiUlFiPs. These efforts are to find their worthy applications & new functionalities. Among available diverse particle engineering technologies/ process, TMDCP, a dry coating process (DCP), advocated being worthy and efficient. The TMDCP finds multidisciplinary applications, mostly in drug development & drug delivery. Said DCP involves fixing and/or attaching coating material (CoM) as particles herein synonym guest particle (GP) onto core/substrate particle (CSP) herein synonym host particle (HP). Attaching/ fixing the GPs onto HPs, in TMDCP, involve their mechanical and/or thermal interactions. Scientific literatures are evidencing diverse techniques and/or process, basing on discussed interactions. Amongst them novel techniques/ processes are Hybridization, Magnetically assisted impaction coating process (MAICP), Mechanofusion, Theta-composer, and high shear compaction. In this area diverse devices/ equipments are prevailing in market. Important are Hybridizer, Magnetically assisted impaction coater (MAIC), Theta-composer, Mechanofusion, Quadro Comil®, Cyclomix®, and many others. Attempt of this article is to discuss and present their method of working, working principle, applicability, limitations, and benefits. Contained information might be beneficial for professionals of pharmaceutical and allied field.

Keywords: dry coating, equipment, particles, processes, thermo-mechanical.

INTRODUCTION

Amongst the diverse pharmaceutical products solid dosage forms are the most popular one [1, 2]. In their manufacturing the most basic unit is FiUlFiPs whose handling is most inevitable [2, 3]. Further these possess extremely cohesive bulk flow and often tend to agglomerate [1-3].

High surface area of FiUlFiPs is reasoning for receiving interest [1, 2, 4]. Researchers (scientists and engineers) in pharmaceutical sectors working extensively in finding applications and taking advantage of many worthy properties and new functionalities attributed to FiUlFiPs, as drug delivery system/carriers [1, 2, 5]. They were exploiting numerous elegant strategies of particle engineering methods to modify density and/or shape of FiUlFiPs to resolve the problems caused by cohesion and find their worthy properties and new functionalities [1-3]. The surface modification strategy of FiUlFiPs is nowadays becoming vital in pharmaceutical sector for the active(s) that are difficult to formulate [1-3].

Modification of surface and surface attributes of FiUlFiPs can be achieved by coating/depositing an appropriate additive on their surfaces [1-3]. The processes of coating/ deposition, by method of either physical deposition or chemical deposition, is for modifying surface attributes of FiUlFiPs are complex one [4, 6-8]. Physical deposition method uses thermal, mechanical, thermo-mechanical, electro-mechanical, or thermodynamic means to produce a thin film of solid at surface of FiUlFiPs [1-3, 7, 8]. Chemical deposition methods involve occurring of chemical changes of a fluid precursor at surface of FiUlFiPs, leaving a solid-layer of coating [6, 7]. Examples are Photo curable coating or photo-curing, gas/vapour phase deposition (like chemical vapour deposition, Atomic/molecular layer deposition) [1, 2]. All these DCP basically comprises of layering/deposition of CoM particles, coalescence and sintering, and levelling [3, 7, 8]; refer Figure-1.

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Review Article

Specialised Coating Processes Finding Pharmaceutical Applicability

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Abstract

The manuscript aims at furnishing comprehensive information pertaining specialised coating technology/ processes. Solid dosage forms and solid particulates (SDFSP) are the major contributing group in the solid pharmaceuticals (SoPs). SDFSP exhibit peculiar physico-chemical properties and interaction behaviour which create problems/ issues during their handling, processing, storage, and use. Modifying and/or engineering surface attributes of SDFSP are advocated as powerful tool to modify their interaction behaviour and realise their worthy applications and functionalities. In this regard coating their surfaces with coating material (CM) is novel approach. Said approach involves wet and dry process for realising deposition of CM onto the surface of SDFSP substrates. Both the processes modify and/or alter innate properties of SDFSP substrates either physically or chemically. Basing on involved wet or dry process the coating method is either dry coating method (DCM) or wet coating method (WCM). Accordingly nowadays there available number of specialised devices, that bases on diverse technologies. Amongst them some involves state-of-art process/ technology like Supercell coating technology (SCT), Chemical vapour deposition (CVD), Atomic/molecular layer deposition (AMLD), Electrostatic deposition, Thermo-mechanical process, Resonant acoustic technology, Fluidised-bed process, Supercritical fluid (SCF) technology, and others. These foundational for commercially availability of specialised equipments like Magnetically Assisted Impaction Coater (MAIC), Resodyn acoustic mixer, Hybridizer®, Theta-composer®. Mechanofusion®, and others. Working and working principle, applicability, benefits, pros and limitations of specialised coating processes and technologies are herein discussed and presented. Contained information hoped to be beneficent for pharmaceutical professionals and technocrats and professionals of allied field.

Keywords: Coating, composite product, modification, specialised, surface.

INTRODUCTION

SDFSP are the most popular one, as drug delivery systems/ carriers [1, 2]. In most of pharmaceutical processes/ operations that deals SoPs, the SDFSP exhibit peculiar physico-chemical properties and interaction behaviour [2, 3]. These issues create problems during their processing, storage, use, and handling [3, 4]. Scientific finding is that said issues are contributed from the surface and surface attributes of the SDFSP, in most instances [2]. Thus handling of said issues is most inevitable [1, 3].

Modifying and/or characterising surface energy/ attributes of SDFSP are doubtlessly powerful tool to modify and/or characterise their interaction behaviour [1, 3, 4]. In this area, pharmaceutical technocrats and researchers are working extensively [1, 3]. They are mostly engaged in modifying SDFSP's interaction behaviour and/or finding their worthy applications and functionalities; for taking assorted advantage [1, 3, 5]. In this regards, they are exploiting numerous elegant strategies/ engineering methods to modify SDFSP's surface and/or surface attributes [1-3]. Among the available diverse strategies/ methods, these technocrats and researchers are considering coating as powerful, elegant, and efficient tool/ methodology [1, 3].

In pharmaceutical field, modification of surface and/or surface attributes of SDFSP thru coating their surfaces with an appropriate additive is extensively exploited, nowadays [1-3]. This strategy is nowadays becoming vital and used extensively for active(s) that are difficult to formulate [1, 3]. Herein coating is used for modifying/ altering innate properties of the SDFSP either physically or chemically [1-3].

Most of techniques/ process for surface modifications/ alterations of SoPs are frequently for functional and/or protective (non-functional) purposes [1, 3, 4]. These purposes includes changes in visual attributes, improved appearance, enhanced mechanical properties, masking of obnoxious odour and taste, stabilisation and improved stability, and defined drug release profile in the biological system [1-3].

Surface modification/ engineering process for SoPs thru coating are of diverse type and origin; refer Figure-1 [1, 3, 6, 7]. Wide diversity of the coating process/ methodologies is inherited with complex processing steps and with complexity of diverse origin and type [1, 3, 8]. Discussing all of them, a vast area and versatile field, is an immense task and out of scope of this manuscript [4, 9].

Content of manuscript is discussion and outline on recent development of specialised coating process/ techniques along with their applicability for SDFSP [1-3]. Presented information will increase visibility of specialised coat processes. This will resulting better understanding

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Development and Evaluation of Nanoemulsion gel for transdermal delivery of Valdecoxib (AbstractView.aspx?PID=2019-12-2-26)

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Research Article

Development and Evaluation of Nanoemulsion gel for Transdermal Delivery of Ketoprofen

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ABSTRACT

To enhance the solubility and permeability of poorly water soluble ketoprofen, nanoemulsion gel was formulated for the treatment of rheumatoid arthritis. Among the oils, surfactants and co-surfactants CAPTEX 200, tween 80 and PEG 400 were selected as they showed maximum solubility to ketoprofen. The pseudo ternary phase-diagrams was constructed to find optimal concentration. The prepared nanoemulsions were subjected trough thermodynamic stability testing, scanning electron microscopy (SEM), zeta-potential, pH, viscosity and diffusion studies. The optimized formulation of nanoemusion H-2 have zeta potential -16.3mV with particle size below 100 nm, pH (7.2), & diffusion studies showing 90.84% drug release after 24 hours. The optimized formulation was incorporated into Carbopol 940 to form nanogel and evaluated for viscosity, pH, in-vitro permeation studies, skin irritation test and anti-inflammatory activity. The viscosity of nanoemulgel was found to be 2050 mPaS, pH (7.5) & it will not produce any local irritation to the skin. The in-vitro skin permeations profile of optimized formulation H2 showed a significant increase ($p < 0.05$) in inhibition after 24h was compared with marketed ketoprofen gel and nanoemulsion gel. The significant increase in permeability ratio (Kp), flux (Jss) and enhancement ratio (Er) was observed. The results suggested that nanoemulsion gels are potential vehicles for improved transdermal delivery of ketoprofen.

Keywords: Nanogel, scanning electron microscopy, zeta-potential, diffusion studies, skin irritation test, anti-inflammatory activity.

INTRODUCTION

Nanoemulsions are colloidal dispersions composed of an oil phase, aqueous phase, surfactant and co-surfactant at appropriate ratios. Unlike coarse emulsions micronized with external energy, nanoemulsions are based on low interfacial tension. This is achieved by adding a co-surfactant, which leads to spontaneous formation of a thermodynamically stable nanoemulsion. The droplet size in the dispersed phase is very small, usually below 10-200 nm in diameter, which makes the nanoemulsions transparent liquids[1,2]. In principle, nanoemulsions can be used to deliver drugs to the patients via several routes, but the topical application of nanoemulsions has gained increasing interest. The three main factors determining the transdermal permeation of drugs are the mobility of drug in the vehicle, release of drug from the vehicle, and permeation of drug into the skin. Nanoemulsions improve the transdermal delivery of several drugs over the conventional topical preparations such as emulsions and gels. Mobility of drugs in nanoemulsions is more facile as compared to the nanoemulsion with gel former which will increase its viscosity and further decrease the permeation in the skin. The superior transdermal flux from nanoemulsions has been shown to be mainly due to their high solubilisation potential for lipophilic and hydrophilic drugs. This generates an increased thermodynamic activity towards the skin[3].It was found that Nanoemulsions could be a very good carrier for topical delivery of highly lipophilic drugs. Ketoprofen is a non-steroidal anti-inflammatory drug (NSAID) which has been extensively used in treatment of rheumatism. Although ketoprofen is highly permeable through stomach, its poor water solubility (log partition co-efficient is 3.11) limits its entry into systemic circulation[4]. During gastric emptying, ketoprofen enters the small intestine where it can't permeate through the membrane despite being solubilised. Moreover, it is associated with oral side effect including gastric irritation when administered orally. Therefore, an eventual need has emerged to develop a transdermal dosage form of ketoprofen to minimize the oral side effect. One of the most promising techniques for enhancement of transdermal drug delivery is formulation of nanoemulsion gel. The main aim of this study is to develop and evaluate ketoprofen loaded nanoemulsion gel for treatment of arthritis and osteoarthritis to overcome the troubles associated with its oral delivery.

MATERIALS AND METHODS

Materials

Ketoprofen was a gift sample from BMR Enterprise, Hyderabad, India. Captex 200, Triacetin, IPM and Oleic acid and carbopol 934P were purchased from BMR Enterprise, Hyderabad. Tween80, Propylene Glycol, Polyethylene Glycol, Triethanolamine and Ethanol were purchased from SD Fine Chemicals Ltd. Mumbai. All other chemicals and solvents used were of analytical grade.

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RESEARCH ARTICLE

Formulation Development of Immediate Release Solid Dispersion Tablets of Lovastatin with Enhanced Dissolution

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ABSTRACT:

The objectives and purpose of the present research work are to improve the solubility and dissolution rate of lovastatin. Solid dispersions of lovastatin were prepared by fusion method by using two selected hydrophilic meltable carriers vis-a-vis gelucire 44/14 and polyethyleneglycol (PEG6000). Neucilin US2 was used as an adsorbent, flow and compressibility promoter and booster. Solid dispersions were evaluated for solubility, phase solubility, flowability, compressibility, Fourier transform infrared spectra (FT-IR), differential scanning calorimetry (DSC) and in-vitro dissolution. Solubility studies showed 8 and 15 fold maximization in solubility for PEG6000 and gelucire 44/14 based solid dispersions respectively. The Gibbs free energy ΔG_{tr}° values were negative for both the carriers indicating spontaneous nature of solubilization. FT-IR and DSC spectra demontrated that drug and carriers are compatible with each other. In-vitro dissolution studies demontrated that gelucirre 44/14 based solid dispersion dissolved more than 95% of lovastatin within 30 min. Solid dispersion exhibiting highest solubility and dissolution rate was compressed and formulated into immediate release (IR) tablets incorporating crosscaramellose sodium as superdisintegrant. *In vitro* dissolution studies for solid dispersion based immediate release tablet, exhibited more than 90% drug dissolution in 30 min(F28). The adsorbent, Neucilin US2 reduced stickiness, imparted good flow and compressibility to solid dispersions. Among the two carriers, gelucire 44/14 demonstrated better solubility and dissolution enhancement potential for lovastatin.

KEYWORDS: Phase solubility, gelucire44/14, PEG6000 and neucillin US2.

INTRODUCTION:

Poorly water soluble active pharmaceutical ingredients (API) illustrate solubility and dissolution related bioavailability problems. Drugs with low aqueous solubility undergo from poor oral bioavailability. The solid dispersion advent has been extensively used to upsurge the solubility, dissolution rate, and thereupon the bioavailability of poorly water soluble drugs. Solid dispersion is defined as dispersion of one or more active ingredients in an inert carrier or matrix at solid state prepared by melting, solvent, or melting solvent method[1].

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The release mechanism of drug from variety of solid dispersions depends upon the physical properties of carriers as well as drug substance and preparation method used. There are number of carriers used in the preparation of solid dispersion like acids, sugars, polymeric materials, surfactants[2].

Lovastatin is an antihyperlipidimic drug, which inhibits the production of cholesterol in the liver. It is an inactive lactone, and hydrolyzed to the corresponding β-hydroxy acid form, which are a principal metabolite and an inhibitor of 3-hydroxy-3-methylglutaryl-Coenzyme A (HMG-CoA) reductase. Chemically identified as [1S-[1a(R*), 3a, 7b; 8b(2S*, 4S*), 8ab]] -1,2,3,7,8,8a-hexahydro-3, 7-dimethyl-8 -[2- (tetrahydro-4 -hydroxy-6-oxo-2H-pyran-2-ylethyl]-1-naphthalenyl 2-methylbutanoate[3]. It is also given prophylactically for