

Acknowledgements

**"Success begins with a fellow's will, It's all in the state of mind
Sooner or later the man who wins, Is the man who thinks he can"**

The spirit of sacrifice is the hallmark of true education. It is not the value of the things that counts; it is the loftiness of the impulse behind the act. The lotus of the mind residing in the lake of the human heart will blossom when the light of divinity illumines it. All education, all wealth, all-ritualistic worship is of no value without genuine devotion to God. Therefore, first I would like to thank the Almighty, for being generous and source of inner support for me.

*At the outset, I pay tribute from the bottom of my heart to **Mahamana Pandit Madan Mohan Malviya Ji (Dada Guru)**, founder of this great University and a great soul for his extraordinary vision that revolutionized the lives of many. I feel honored to have been endowed with a part of his legacy to the nation, IIT (BHU). This institute is unparalleled in its beauty, history and culture and I am beholden beyond words for all I have gained here.*

*It is definitely a pleasing privilege for me to express my gratefulness and indebtedness to my revered supervisor **Mr. A. K. Srivastava**, whose patience and support was instrumental in accomplishing the project. I shall remain indebted to him for his diligent efforts and professional competencies, which contributed colossally towards the completion of the project. His conscientious suggestions, creative ideas, critical evaluation and homely atmosphere in which he makes one work, are some of the supreme qualities that will be cherished as a quintessential example of the brilliant guidance. I feel very much honored and it has been a real privilege for me to get an opportunity to work under him.*

*I am indeed obliged and sincerely thankful to Ex-Head **Prof B. Mishra** & Head **Prof S. K. Singh** who taught me the challenges of real life and also thankful to other faculties of Department of Pharmaceutical Engineering & Technology, IIT (BHU) for allowing me to use the facilities in the department to carry out the research work and for his kind help during the course of my study.*

*My heartfelt thanks to all my **teachers** right from my schooling till now for their warm heartedness, keen interest, incessant encouragement and heartfelt wishes for my bright career.*

*I own a deep sense of gratitude to Prof. **Rajiv Prakesh, incharge Central Instrument Lab Facility, of IIT (BHU)** for his valuable guidance and providing facilities during the course of my work.*

*I am deeply indebted to with special reference to the **Prof. Pralay Maiti, School of Materials Science and Technology, Indian Institute of Technology (BHU)** who providing me valuable suggestion, co-operation towards the project that helped me completes this work.*

*My heartfelt thanks goes to my beloved seniors **Mr. Manish, Mr. Anupam, Mr. Damiki Laloo** and all other **PhD scholars** for their suggestions, guidance, kind help and affection.*

I also convey my regards in the form of thanks to all Juniors and friends **Mr. Harsh, Mr. Harish, Mr Arvind, Miss. Jagdeep, Mrs. Pooja, Mrs. Saniya Jawed, Miss Aprajita** who rendered me their constant help and suggestions.

Words cannot express the love and gratitude for my **beloved parents** and my **siblings** who have been constantly there for me. They have been one true and constant source of inspiration for all the years of my life I have spent here.

With deepest gratitude and love, I bow down at the lotus feet of **Maa Gayatri & gurudev, Acharya Shriram Sharma Ji**, for never ever leaving me alone during the times of trials and sufferings and molding me into what I am today. It was all guru sahib's will which brought me to IIT (BHU) where he never left my side for, it is the only University in India with a Temple of lord Shiva Temple & Gurudwara on campus. I erred time and again, fell prey to ruses of evil from which I rose only with almighty lord's grace. I cannot thank God enough ever for that.

The financial assistance in the form of Research fellowship by the **University Grant Commission, New Delhi**, is also acknowledged.

Lastly, I pray to almighty for the '**Moksha**' of my experimental animals, those little rats and mice, whose sacrifices proved the truth of my thesis work done for the betterment of the ailing humanity.

IIT(BHU), Varanasi
25 December, 2017

(Gyanendra Singh)