

## **BAB 5**

### **SIMPULAN**

#### **5.1. Simpulan**

Dari data penelitian yang telah diinterpretasikan, dapat ditarik kesimpulan :

- Tablet likuisolid ibuprofen yang menggunakan gliserin sebagai pelarut *non volatile* dan HPMC K4M sebagai polimer dapat meningkatkan disolusi ibuprofen dibandingkan dengan tablet ibuprofen konvensional.
- Penambahan HPMC K4M sebagai polimer hidrofilik dapat meningkatkan persen pelepasan dan konstanta laju disolusi tablet likuisolid ibuprofen. Pada formula D dengan konsentrasi penambahan polimer HPMC K4M yang lebih besar dari formula B dan C menunjukkan penurunan persen pelepasan dan konstanta laju disolusi, penambahan polimer dengan konsentrasi yang lebih besar dapat menghambat pelepasan obat karena kemampuan polimer untuk membentuk gel.

#### **5.2. Alur Penelitian Selanjutnya**

Dapat dilakukan penelitian lebih lanjut mengenai formulasi tablet likuisolid dengan mencari formula optimum yang meliputi konsentrasi obat dalam pelarut, konsentrasi polimer, konsentrasi bahan pengisi serta perbandingan antara bahan pengisi dan penyalut.

## DAFTAR PUSTAKA

- Alderborn, G., 2002. Tablets and compaction. In Aulton, E. (Ed.) **Pharmaceutics The Science of Dosage Form Design**. 2<sup>nd</sup> Edition. Churchill Livingstone, London, 398.
- Anonim, 1979, **Farmakope Indonesia**, ed. III, Departemen Kesehatan RI, Jakarta.
- Anonim, 1995, **Farmakope Indonesia**, ed. IV, Departemen Kesehatan RI, Jakarta, 4, 166, 449-450, 488-489, 515, 683, 783-784, 999-1000.
- Anonim, 1997, **AHFS**, Drug Information AMERICAN Society of Health System Pharmacist, Inc., Bethesda, 1499-1504.
- Anonim, 2007, **US Pharmacopeia XXX**, US Pharmacopeial Convention Inc., Rockville.
- Ansel, H. C., 1989, **Pengantar Bentuk Sediaan Farmasi**, ed. 4, terjemahan Farida Ibrahim, Universitas Indonesia, Jakarta, 57.
- Banakar, U.V., 1992, **Pharmaceutical Disolution Testing**, Marcel Dekker Inc., New York, 19-25.
- Banker, G.S. and N.R. Anderson, 1994, Tablet, in: **The Theory and Practice of Industrial Pharmacy: Tablet**, L. Lachman, H.A. Lieberman, and J.L. Kanig (Eds.), 3<sup>rd</sup> ed., Lea and Febiger, Philadelphia, 259, 299, 316 – 329.
- Biju, S.S., S. Talegaonkar, P. R. Mishra, and R. K. Khar, 2006, Vesikular System: An Overview, **Indian Journal Of Pharmaceutical Science**, 68(2), 141-153.
- Bolton, S., 1990, **Pharmaceutical Statistic: Practical and Clinical Applications**, 2<sup>nd</sup> ed., Marcel Dekker, Inc., New York, 324-427.
- Cartensen, J.T. and C.C. Ping, 1977, Flow rate and repose angles of wet processed granulation, **J.Pharm.Sci.**, 66, 1236 – 1237.
- Dibbern, H.W., R.M. Muller, and E. Wirbitzki, 2002, **UV and IR Spectra: Pharmaceutical Substances (UV and IR) and Pharmaceutical and Cosmetic Excipients (IR)**, Editio Cantor Verlag, Germany.

Duchene, D., 1983, Tablet Disintegration, In: **Topic in Pharmaceutical Science**, P.D. Breimer, and P. Spesier (Eds.), Proceeding of The 43<sup>rd</sup> International Congress of Pharmaceutical, Amsterdam – New York – Oxford, 387 – 399.

Forner, D.E., N.R. Anderson, G.S. Banker, T.W. Rosanske, and R.E. Gordon, 1981, Granulation and Tablet Characteristic, In: **Pharmaceutical Dosage Form**, H. A. Lieberman, L. Lachman, and J.B. Schwartz (Eds.), Vol. 2., Marcel Dekker, Inc., New York, 109 – 143, 188 – 190.

Gothoskar, A. V., 2005, Extended Release Formulation Using Hydrophilic Matrices. **Modified Release Forum**, 4-5.

Green, J.M., 1996, A Practical Guide to Analytical Method Validation, **Analytical Chemistry**, 68, 305-309.

Gubbi S. and R. Jarag, 2009, Liquisolid Technique for Enhancement of Dissolution Properties of Bromhexine Hydrochloride, **J. Pharm**, 2(2), 382 – 386.

Javadzadeh, Y., B. J. Navimipour, and A. Nokhodchi, 2007, Liquisolid Technique for Dissolution Rate Enhancement of a High Dose Water Insoluble Drug (Carbamazepine), **International Journal of Pharmaceutics**, 341, 26 – 34.

Javadzadeh, Y., H. Shariati, E. Movahhed-Danesh, and A. Nokhodichi, 2009, Effect of some Commercial Grades of Microcrystalline Cellulose on Flowability, Compressibility, and Dissolution Profile of Piroxicam Liquisolid Compacts, **Drug Development and Industrial Pharmacy**, 35, 243-251.

**Karmarkar, A.B., I.D.Gonjari, A.H. Hosmani, P.N. Dhabale, and S.B. Bhise, 2009, Liquisolid Tablets: A Novel Approach for Drug Delivery**, International Journal of Health Research, 2(1), 45-50.

Khan, K.A., 1975, The Concept of Dissolution Efficiency. **J. Pharm**, 27(1), 48-49.

Kibbe, A.H. , 2000, **Handbook of Pharmaceutical Excipients**, 3<sup>rd</sup> ed., The Pharmaceutical Press, London, 102, 143, 305, 501, 555.

Langenbucher, F., 1972, Linearization of Dissolution Rate Curve by Weibull Distribution, **Journal of Pharmaceutical Sciences**, 24, 979-981.

Liao, C.C. and C.I. Jarowski, 2006, Dissolution Rates of Corticoid Solutions Dispersed on Silicas, **Journal of Pharmaceutical Sciences**, 73(3), 401-403.

Lund, W., 1994, **The Pharmaceutical Codex Principles and Practices of Pharmaceutic**, 12<sup>th</sup> ed., The Pharmaceutical Press, London, 908-911.

Martin, A., J. Swarbrick, and A. Cammarata, 1983, **Physical Pharmacy**, 3<sup>rd</sup> ed., Lea and Febiger, Philadelphia, 845-850.

Parrott, E.L., 1971, **Pharmaceutical Technology Fundamental Pharmaceutics**, 3<sup>rd</sup> ed., Burgess Publishing Company, Minneapolis, 17-19, 82, 160-162.

Rowe, R.C., P.J. Sheskey, and M. E. Quinn, 2009, **Handbook of Pharmaceuticals Excipient**, 6<sup>th</sup> ed., The Pharmaceutical Press, London, 283, 581.

Rudnic, E., 1990, Oral Solid Dosage Form, In: Gennaro, A. R., dkk., **Remington Pharmaceutical Sciences**, 18<sup>th</sup> ed., Mack Publishing Company, Easton, Pennsylvania, 1673-1644.

Scheffler, C.W., 1987, **Statistik untuk Biologi, Farmasi, Kedokteran, dan Ilmu Bertautan**, terjemahan Suroso, Institut Teknologi Bandung, Bandung.

Shargel, L. and A. B. C. Yu, 1999, **Applied Biopharmaceutics and Pharmacokinetics**, 4<sup>th</sup> ed. McGraw – Hill. New York, 8, 132, 169-200.

Siepmann J. and N.A. Peppas, 2001, Modeling of Drug Release from Delivery Systems Based on Hydroxypropyl Methylcellulose (HPMC). **Adv.Drug Deliv.Rev.**, 48, 139-157.

Siregar, C. J. P., 1992, **Proses Validasi Manufaktur Sediaan Tablet**, Institut Teknologi Bandung, Bandung, 29-31.

Soedigdo, S. dan P. Soedigdo, 1977, **Pengantar Cara Statistika Kimia**, Institut Teknologi Bandung, Bandung.

Spireas, S., 2002, Lquisolid System and Methods of Preparation Same, **Pharmaceutical Research**, vol 9, 1-6.

Sweetman, S. C., 2009, **Martindale The Complete Drug Reference**, 36<sup>th</sup> ed., The Pharmaceutical Press, London, 64.

Vazquez M.J., B. Perez-Marcos, J.L. Gomez-Amoza, R. Matinez-Pacheco, C. Souto, and A. Concheiro, 1992, Influence of Technological Variables on

Drug Release of Drug from Hydrophilic Matrices, **Drug Development and Industrial Pharmacy**, 18, 1355-1375.

Voigt, R., 1995, **Buku Pelajaran Teknologi Farmasi**, Terjemahan S. Noerono dan M. S. Reksohardiprojo, Gadjah Mada University Press, Yogyakarta, 163-210.

Wade, A. and P.S. Weller, 1994, **Handbook of Pharmaceutical Exipients**, 2<sup>nd</sup> ed., The Pharmaceutical Press, London, 84 – 86.

Wagner, J. G., 1971, **Biopharmaceutics and Relevant Pharmacokinetics**, 1<sup>st</sup> ed., Drug Intelligence Publications, Illinois, 64-110.

Wells, J.T., 1988, **Pharmaceutical Formulation: The Physicochemical Properties of Drug Substance**, Ellis Howard, Ltd., Chester, 209-211.

Williams, R O., M.A. Sykora, and V. Mahaguna, 2001, Method to Recover a Lipophilic Drug from Hydroxypropyl Methylcellulose Matrix Tablets, **AAPS PharmSciTech**, 8, 1-9.

Wilmana, P. F., 1995, Analgesik – Antipiretik Analgesik Anti-Inflamasi Nonsteroid dan Obat Pirai, dalam: **Farmakologi dan Terapi**, Sulistia G. Ganiswarna (Ed.), edisi 4, Gaya Baru, Jakarta, 207-218.

Zainuddin, M., 2000, Validasi Metode Analisis Kuantitatif secara Spektrofotometris Ultra Ungu-Sinar Tampak (Uv-Vis), **Pelatihan Teknik Tenaga Pengujian Regional Balai POM**, Balai POM, Surabaya.