

# ABSTRACT

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Title of Thesis **Evaluation of rheological and adhesive properties of semisolid excipients**

This thesis deals with the evaluation of rheological and adhesive properties of semisolid excipients by rotary rheometer Kinexus. In the theoretical part, bioadhesion is defined, testing methods of bioadhesion of semisolid excipients are described, and methods for testing of rheological properties. Rheological behaviour of semisolid excipients was evaluated by flow and viscosity curves analysed using Power Law and Herschel - Bulkley model. Squeeze and pull off test with analyses was used to evaluate the adhesion properties on a rotary rheometer. As model excipients Adeps lanae, Adeps lanae cum aqua, Alcoholis cetylici unguentum, Alcoholis cetylici cremor, Cremor basalis, Vaselinum album and Vaselinum album after adding 5% of Cera alba, 10% of Cera alba, or 5% of Paraffinum solidum were used. Consistency characterized by a coefficient  $K$  of Power law model decreases in the order Adeps lanae cum aqua, Adeps lanae, Vaselinum album, Cremor basalis. Spreadability assessed by flow behaviour index  $n$  of Power law model decreases in the order Vaselinum album, Adeps lanae cum aqua, Cremor basalis. Adhesiveness assessed using the maximum force was the highest in Adeps lanae cum aqua, followed Adeps lanae, Vaselinum album and Cremor basalis. Rheological test Shear rate table with Power law model fit or Herschel - Bulkley model fit can be used to assess the consistency and spreadability of semisolid excipients. Consistency is characterized by consistency coefficient  $K$ , and spreadability by flow behaviour index  $n$ . The adhesive properties can be evaluated using a rotational rheometer Kinexus by Squeeze and pull off test with analyses. The maximum force is the best characterization of the adhesive properties of semisolid excipients.

**Keywords:** semisolid excipients, adhesion, spreadability, rheogram, viscosity curve, coefficient of consistency, index of flow behaviour