mesh screen and were then used for the following physical tests. Particle size distribution was determined using a sieving method. A weighed amount (400 g) of granulated excipients was placed on the first sieve of a nest of US Standard 8-in, stainless-steel sieves (mesh sizes of 24, 32, 42, 60, 80, and 115) arranged in order of decreasing aperture size. The nest of sieves was subjected to vibration for at least 5 min, or until no apparent change in weight was observed. After sieving, the amount retained on each sieve was weighed, and the cumulative percent retained on each sieve was calculated.

An A.B.D. Fine Particle Characteristics Measuring Instrument (Tsutsui Scientific Instruments, Tokyo, Japan) was used to determine the bulk and tapped densities, and repose angle of the powders. Carr's index[16] was calculated as the ratio of the difference between tapped density and bulk density to tapped density. The average of 3 determinations was reported.

Preparation of Solid Dispersion Systems

A solvent method was employed to prepare solid dispersion systems for nifedipine. PVP and HPMC were selected as the water-soluble polymers. After dissolving nifedipine and PVP (K30, 1:1 w/w) or HPMC (5 cps, 1:1 or 1:3 w/w) in a suitable volume of an acetone/water mixture, the solvent mixture was completely evaporated in a forced-air convention oven at a temperature of 50-60 °C. Dried residues were ground with a coffee mill, and granules passing an 80-mesh sieve were collected. These solid dispersion samples were then stored in desiccators protected from light until use.

Analysis by Differential Scanning Calorimetry

A differential calorimeter (DSC Thermal Analyst 2000) was used to determine the phase transition temperature for the solid dispersion systems of nifedipine with PVP (1:1), HPMC (5 cps, 1:1), and HPMC (5 cps, 1:3). A heating rate of 10 °C /min was employed from 30 to 250 °C in an atmosphere of nitrogen with samples placed in aluminum pans. Indium was used as the calibration standard.

Preparation and Characterization of Nifedipine Matrix Tablets

Nifedipine controlled-release tablets of the matrix type were prepared by direct compression as foll nifedipine or its solid dispersion (equivalent to 2(nifedipine) and 1 talc were blended initially wit granulated excipients prepared above. The mix was then compressed to form tablets using a Ca laboratory press (Fred S. Carver, USA) utilizi standard 7.5-mm concave punch and die system 1-ton compression force. The press was set at a ri speed of 2 mm/min; a dwell time of 0.6 s was used ing compression. A total weight equivalent to 20 of nifedipine was prepared for each tablet. Friab was evaluated by dropping 10 tablets 100 times Roche Friabilator (Model AE-20, Aikho Engineer ROC). The crushing strength of tablets was measu with a hardness tester (Euweka TB21). The thickn was determined using a thickness tester (Mitutoyo

Dissolution Test

The USP paddle method was used to measure solution rates. The dissolution medium was pH simulated gastric fluid maintained at 37.0 ± 0.5 with the addition of 1% (w/v) Tween 80. Samp were withdrawn at fixed time intervals and analy for the drug using a UV method. The detection wa length for UV analysis was 350 nm, and the calib tion curve was constructed to determine the drug c centration in the samples.

RESULTS AND DISCUSSION

It was previously reported that matrix tablets p duced with particles formed by granulated lactose dicalcium phosphate with film-forming polymers, ther Eudragit RS-30D, and RL-30D or Surelease, hibited satisfactory friability of less than 1 except those prepared from lactose particles granulated wit low percentage of ethylcellulose and from plain lact granules.[17] Although friability can be improved by creasing the percentage of film-forming polymers the granule formulations, the wet mass after adding granulation solution can become too viscous to ever distribute the granulating agent among the particl Two other studies also found that it was necessary add HPMC (Metolose 60-SH, 50 cps) to improve cohesion of granulated excipients when using a low percentage of film-forming polymer in granule form