

## Salicylic Acid Tablets: Calibration Notes

Dissolution equipment that has been routinely used for a number of years (three-five) should be serviced if out-of-range values are obtained. Any dissolution equipment that is used routinely should be calibrated at regular intervals. Relocation of apparatus always requires recalibration. Some USP Dissolution tests require 2-L vessels or speeds other than 50 and 100 rpm. The equipment is suitable for these other conditions if it passes the calibration tests.

### Sources of Error in Calibration Testing

**Deaeration of medium.** Improper deaeration is a common problem. This formulation has been demonstrated to be exquisitely sensitive to dissolved gases in the medium. The deaeration method used in the testing to establish the certificate ranges is as follows: Heat a suitable volume of water to 41° and filter with the aid of vacuum through a 0.45- $\mu$ m-porosity membrane into a suitable filtering flask, equipped with a stirring device. Seal the flask and continue to apply a vacuum while stirring for an additional five minutes. Do not allow the temperature of the *Dissolution Medium* to fall below 37° prior to the initiation of the test. Gently transfer the Medium directly to the vessel. Do not introduce air into the Medium. Rotating the Apparatus 2 shafts to speed equilibration to 37° is discouraged. Use medium promptly after it is equilibrated.

**Vessels.** Vessels must be clean. Use of an unacceptable vessel is a systematic error.

**Vibration and mechanical problems.** When not properly examined and maintained, factors such as dissolution head coplanarity, shaft perpendicularity, tension on the drive chain or belt, centering, and operating condition of the gear plates can adversely affect dissolution. Digital rpm readings may not necessarily represent individual spindle speeds. Visual inspection may be needed to observe surging of the separate spindles. To minimize vibration effects, the dissolution equipment should be on a stable benchtop or table. Other mechanical equipment using fans, pumps, or other vibration sources should be removed from the area or isolated in some other way. Turbulence in the waterbath caused by circulation patterns can affect results in one or more vessels.

**Automation.** Always validate the automated method, including the analytical method and sampling method, by performing a parallel manual analysis, withdrawing test samples at the same times, and comparing to the automated results. Filter probes may become clogged, absorb the active ingredient, or generate additional turbulence through the air-purging step. Be alert to the possibility of carryover among samplings. Automated systems may not account for dilution and the absorbance reading may be over 1.0 absorbance units. Linearity above 1.0 absorbance should be established with a standard curve.

**Tablets.** The Calibrator Tablets should be stored in the original containers in a dry place. Avoid excess humidity. When testing, take the tablets from the bottle and begin the dissolution test immediately.

**Reference Standard.** Use the current lot of USP Reference Standard and follow any drying instructions on the label. Prepare the standard solution on the day of use.

**Filtering.** Do not centrifuge sample. The sample aliquot should be filtered immediately after the sample is drawn. The filters should be tested for interference from leachables or by adsorption of the drug. A separate clean syringe and filter should be used for sampling each vessel.

**Paddles and baskets.** The shafts of both apparatuses should be straight. A simple test of this is to roll the shaft on the bench top with the paddle blade or prongs for the basket hanging over the edge. The shaft should roll evenly like an arrow shaft. Baskets should be straight and not frayed. Routine use in hydrochloric acid Medium causes deterioration of the stainless steel baskets. Baskets should attach firmly to the shaft prongs. Evaporation lids should be used. Inspect them for fit or warping.