

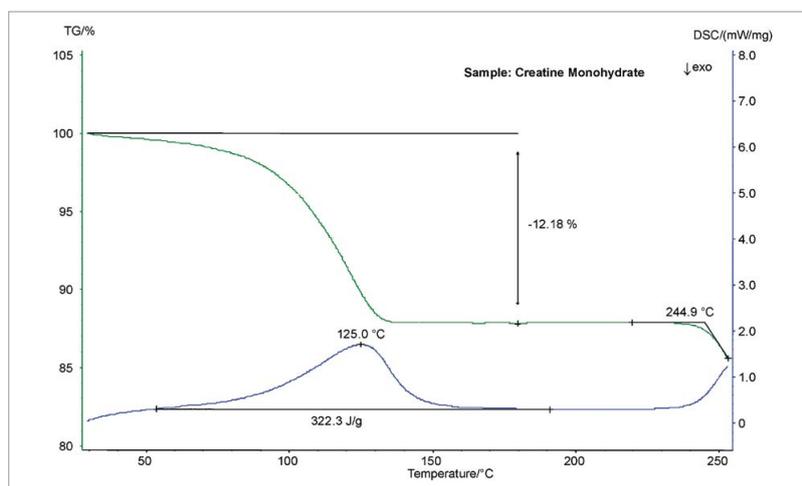
APPLICATION SHEET

ORGANICS – PHARMACEUTICALS/FOOD

CREATINE MONOHYDRATE

Creatine is a nitrogenous organic acid that naturally occurs in vertebrates and helps supply energy to the muscle cells. In the human body, creatine is mainly synthesized in the liver by the use of parts from three different amino acids. 95% of it is later stored in the skeletal muscles, the rest in the brain, heart and testes. In human bodies, most of the creatine intake comes from food (mainly from meat and fish). It is public knowledge that meat enhanced perfor-

mance long before modern science discovered creatine. Creatine supplements designed for strength enhancement are commercially available until 1993. Creatine is often taken by humans as a supplement for those wishing to gain muscle mass (athletes, bodybuilders). There are numerous forms but the most common are creatine monohydrate – creatine bonded with a molecule of water.



Instrument

STA 449 C Jupiter®

Test Conditions

Temperature range	RT ... 250°C
Heating/cooling rates	10 K/min
Atmosphere	Argon at 70 ml/min
Sample mass	24.09 mg
Crucible	Pt
Sensor	TG type S

Results

A creatine monohydrate sample was investigated using STA (simultaneous TG and true DSC). Upon heating the sample, a mass-loss step of 12.2% was observed which is due to the release of 1 formula unit H₂O. The theoretical stoichiometrical mass loss would be 12.1%. The larger measured mass loss can be explained by the evaporation of surface humidity. During dehydration, an endothermal DSC peak at 125°C with an enthalpy of 322 J/g was detected. At an extrapolated onset temperature of 245°C, the onset of decomposition occurred as can be seen from the beginning decrease of the sample mass together with an endothermal DSC signal.