Abstract: Introduction: According to the most commonly used definition hydrogels are three dimensional networks of hydrophilic polymers able to absorb a large amount of water and biological fluids. Recently, the attention of researchers is mainly focused on hydrogel materials based on natural biodegradable polymers. The thermal behavior of hydrogel is important in relation to its properties for controlling the release rate in order to have a suitable drug dosage form. The aim of presented work was synthesis of ionically crosslinked biocompatible Hydrogels by free-radical polymerization of methacrylic acid (MMA) and allyl α-D-galactopyranoside, using 1, 6-hexandiol diacylate and 1, 6-hexandi propoxylate diacylate as cross-linking agents. The new sugar bearing galactopyranoside based hydrogels were analyzed to test their thermal behavior as potentially influence the hydrolyse behavior of the newly synthesized carriers.Method: Changes in chemical structure of allyl α-D-galactopyranoside hydrogels after their ionic crosslinking were analysed by FTIR spectroscopy. The influence of crosslinking process on thermal stability of allyl α-D-galactopyranoside hydrogels was studied using thermogravimetric and differential scanning calorimetry methods. Glass transition temperature (Tg) was determined using a differential scanning calorimeter (DSC, TGA/SDTA 822) at a heating rate of 10 °C/min under nitrogen atmosphere. Results: increasing MAA content in monomer feed resulted in higher Tg, which is due to increasing internal hydrogen bonds between the polymer chains. Also, Tg values increased with increasing cross-linking density. This is due to decreasing flexibility and mobility of polymer chain. Diffusion rate of small molecules through polymer matrix is often lowered with the increasing Tg for the increasing restriction of chain-segment mobility. By analyzing the thermal behavior of carriers containing a drug model, olsalazine [3, 3-azobis (6-hydroxy benzoic acid)] (OSZ), it is revealed that Tg can influence the OSZ release behaviors of hydrogels. Conclusions: Changes in chemical structure of newly synthesized hydrogel after their crosslinking were analysed by FTIR spectroscopy. The influence of crosslinking process on thermal stability of hydrogels was studied using differential scanning calorimetry methods. The Tg of composites in this study are higher than 142 °C, which is much higher than the temperature of release study. Therefore, the effect of Tg difference may be less important for drug release study.