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Isothermal crystallization kinetics of Poly (lactic acid) studied by ultrafast chip calorimeter[1] JING JIANG, WEI JIANG, ZIJIE HUANG, DONGSHAN ZHOU, GI XUE, Nanjing University, DONGSHAN ZHOU TEAM — Poly (lactic acid) (PLA) is a biocompatible, biodegradable polymer which has attracted much attention. The crystallization ability, as one of the most factors influencing the physical properties of the biomaterials such as thermal, mechanical, and biodegradable properties, has been widely studied mainly by differential scanning calorimeters. However, although the crystallization of PLA is relatively slow, it's difficult to avoid the crystallization from the nuclei or the structure reorganization of the metastable crystalline formed during the annealing process when we use the normal DSC with the heating rate on the level of tens of K/min. With the chip calorimeter whose scanning rate can go up to 1000 K/s, we can avoid the structure reorganization of metastable crystalline during the heating. In this case we annealed the PLA sample in the 80-120^{o}C temperature range and found the relationship between the onset the melting temperature T_m and crystallization temperature T_c is $T_m = 0.53T_c + 213.5$ and the equilibrium melting temperature is $T_{m,f}$=179.6^{o}C.

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