

Abstract

This thesis is devoted to fractional calculus in nonreflexive Banach spaces and existence results for the fractional differential equations. Using fractional Pettis integral and fractional pseudo-derivative, we discussed fractional calculus and fractional differential equations in nonreflexive Banach spaces, equipped with weak topology. We obtained some results on existence of solution of fractional differential equations. Furthermore, applying fractional Pettis integral and fractional pseudo-derivative we discussed the existence of solution of multi-term fractional differential equation, in nonreflexive Banach spaces, equipped with weak topology. Finally, assuming the concept of Riemann-Pettis integral, we introduced and studied the notions of fractional Riemann-Pettis integral and fractional Caputo weak derivative. Using these tool we obtained an existence result for weak solution of fractional differential equations in a nonreflexive Banach space equipped with the weak topology.