INTRODUCTION

Production of biodegradable materials based on natural resources is a growing area of interest due to the serious problem of waste accumulation and plastic contamination in oceans and seas. Besides, naturally available materials in their nanometric scale like cellulose have attracted great interest during the last years, owing to their low density, high specific surface, high aspect ratio, biocompatibility, abundance and wide functionalization possibilities to obtain high value products with low impact. Among this functionalization possibilities, transition metal containing nanocellulose is an interesting alternative for different application fields.

This work reports on the development of cellulose nanocrystals (CNC) based nanomaterials (aerogels and films) loaded with different metal oxide nanoparticles (MNP) through scalable and surfactantless methods. Furthermore, CNC/MNP aerogels have been reinforced by crosslinking with other biopolymer, sodium alginate (ALG). Morphological aspects and different properties like wettability, disintegrability, UV-Visible transmittance and thermal stability and mechanical resistance have been studied and compared.