Abstract
General knowledge of the molecular properties of the potential contaminant proteins benefits the selection and design of suitable strategies for the recovery of recombinant proteins. A novel experimental approach that resulted from the combination of quantitative 2D electrophoresis (2-DE) with hydrophobic partitioning in aqueous twophase systems (ATPS) was applied for the three-dimensional characterization of soybean proteins. The three dimensional scatter plots of molecular weight (MR), isoelectric point (pl) and surface hydrophobicity (log Kp) were obtained using two different ATPS compositions, PEG 3350 (15.7%)-sodium sulfate (8.9%)-NaCl (3%) and PEG 3350 (14.8%)-potassium phosphates (10.3%)-NaCl (3%). Molecular properties of soybean proteins were obtained (MR, pl and log Kp) simultaneously using two different ATPS resulting in two different protein profiles, suggesting a high influence of the phase-forming salt on the partitioning behavior of soybean proteins. The presence of dominant proteins derived from two main storage proteins limited the number of spots detected in gels and consequently the number of 3D spots characterized. The identification of the major contaminants proteins and their relative concentration depicted in the tridimensional graph represents the first stage in the selection of better strategies for the purification of products or the selection of a potential host in the development of bioprocesses.

Keywords
2D-electrophoresis; aqueous two-phase systems; soybean; protein characterization.