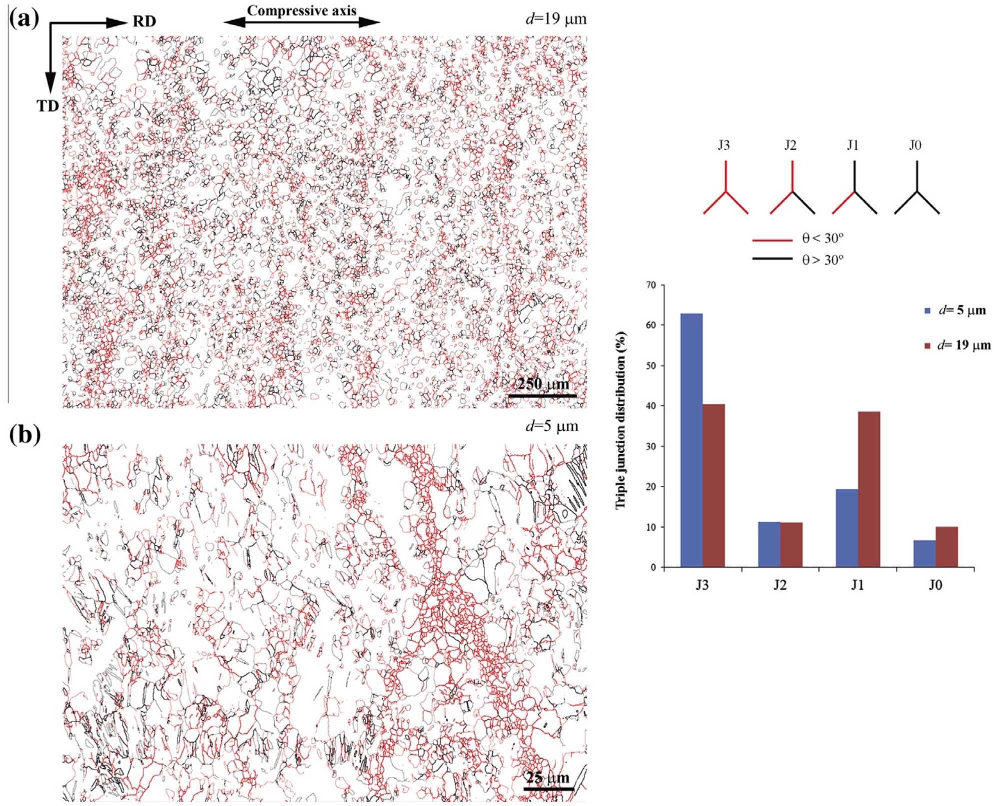

Fig. 6. GB maps corresponding to the EBSD SF maps of Fig. 5. (a) $d = 19$ μm and (b) $d = 5$ μm. GBs with $\theta < 30°$ are colored in red while GBs with $\theta > 30°$ are colored in black. The corresponding triple junction distribution histograms are also included. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

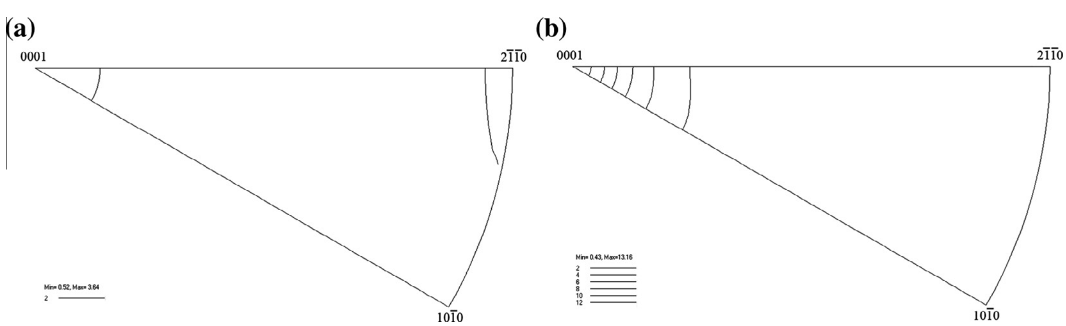

Fig. 7. Polycrystal with $d = 5$ μm. Misorientation axis distributions for boundaries with misorientation angles between 2° and 30° (θ_{th}) corresponding to (a) boundaries included in the area depicted in the EBSD map of Fig. 3a, and (b) boundaries inside the deformation bands across which basal slip transfer took place.

with $SF_{basal} > 0.2$ for the two polycrystals (Fig. 6a for $d = 19$ μm and Fig. 6b for $d = 5$ μm). Red and black lines represent boundaries with $\theta < 30°$ (special GBs) and with $\theta > 30°$ (general GBs), respectively. The corresponding triple junction distributions are also shown in Fig. 6. J_i junctions are those coordinated by i special boundaries [49]. The fraction of J_2 and J_3 junctions ($f_{J_2+J_3}$) is 51% in the polycrystal with $d = 19$ μm and 74% in the polycrystal with $d = 5$ μm. This analysis reveals, first, that the degree of connectivity of grains that are well oriented for basal slip is higher in the finest polycrystal. Second, the present results support the existence of a threshold value of the fraction of special GBs beyond which strain is accommodated by basal slip along deformation bands. This behavior resembles that reported earlier for *high contrast* properties, which depend strongly on the nature of the GB network [49].

Fig. 7 shows, furthermore, the distribution of misorientation axes for the special boundaries of the polycrystal with $d = 5$ μm. Fig. 7a corresponds to the boundaries included in the area depicted in Figs. 3a and 7b corresponds to the boundaries inside the deformation bands across which basal slip transfer took place. It can be seen that the misorientation angles of the boundaries that favor basal slip transfer are mostly parallel to the c-axis.

Thus, this work evidences that the origin of the transition between twinning and slip-dominated flow with decreasing grain size in pure Mg might be the larger