



Multiple daytime nucleation events at the high altitude station of Chacaltaya (5240 m a.s.l.), Bolivia

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New particle formation (NPF) events were detected and analysed at the highest measurement site in the world, Chacaltaya (5240 m a.s.l.), Bolivia between 1st January and 31st December 2012. NPF frequency at Chacaltaya is one of the highest reported so far (63.9%) and shows a clear seasonal dependency with maximum up to 100% during the dry season. The occurrence of NPF was found to be disturbed by the presence of cloud in the vicinity of the station during the wet season. In contrast, no inhibiting effect of the condensation sink was observed. Multiple NPF events are seen on almost 50% of event days. The median particle formation rate computed for first position events is increased during the dry season ($1.90 \text{ cm}^{-3}\text{s}^{-1}$) compared to the wet season ($1.02 \text{ cm}^{-3}\text{s}^{-1}$). Growth rate (GR) increases with particle size, being 3.64, 6.86 and 7.62 nm h^{-1} for size range 1.5-3 nm, 3-7 nm and 7-20 nm, respectively. GRs are on average enhanced during the wet season, which could be explained by higher amount of biogenic volatile organic compounds transported from the Amazon rainforest. The NPF events frequency is clearly enhanced when air masses originate from the oceanic sector, with a frequency of occurrence close to 1. However, based on the growth rate of the largest particle size range, we calculate that particles most likely nucleate after the oceanic air masses reach the land.