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Stable isotopic composition of δ15N-NO_3- and δ18O-NO_3- in precipitation of Kathmandu valley during monsoon season

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During monsoon, we collected 33 precipitation samples on daily basis and measured the nitrogen and oxygen isotopic composition of NO_3- at the central part of Kathmandu valley, Nepal. The δ15N of precipitation measured was in the range of -5.9 to +3.3‰ for NO_3- with mass weighted mean of -1.1 ‰Ṗositive values of δ15N during this period showed that NO_x emitted from the vehicles sources and negative values showing the influence of agricultural activities in the periphery causing nitrogen oxide emissions from soil under moist and warmer conditions. The δ18O values of NO_3- ranged from +12.2 to +44.5 ‰ with the mass weighted mean of 24.6 ‰ where 36% of the samples were lower than atmospheric O_2 (23.5‰ and entire samples were far below the expected minimum of 55‰ in this site. Though the valley is highly polluted during the winter season, the level of pollution is lower during the monsoon season. Our results emphasized either peroxy radicals' pathway donating totally instead of O_3 for the formation of δ18O values of NO_3- or the importance of dust particles.