General comments:

Zanoni et al. report the first total OH reactivity dataset from a Mediterranean receptor site acquired during the summer of 2013 within the framework of the CHARMEX campaign. The dataset includes comprehensive speciated VOC measurements, along with the total OH reactivity measurements. The measured total OH reactivity at the site was between 3 to 17 s^{-1} , with an average of 5 s^{-1} , co-varying with the air temperature. High missing OH reactivity greater than 50% was observed occasionally which the authors speculate to be majorly due to oxygenated molecules, mostly formed from reactions biogenic trace gases. The results demonstrate that local biogenic emissions are more important than transported pollution at the receptor site for ambient OH reactivity. These findings are very interesting and the work will be a valuable addition to OH reactivity datasets in the literature, especially from remote sites. The paper is well structured and generally well written. I recommend publication in ACP after the following specific concerns/points have been addressed by the authors.

Major points that should be clarified/added in revised MS:

1) The classification of anthropogenic VOCs needs to be qualified. There are several published reports now that show release of aromatic compounds from stressed vegetation (e.g. Misztal, P. K. et al., Scientific Reports (Nature Publishing Group), 5, 2015.

Have the authors examined the co-variation of aromatics with ambient temperature?

2) Use of PMF factors and data: Too many in prep papers (e.g. Michoud et al.) are being relied upon for interpretation of the results of this MS and since the details of those are unavailable this does weaken the MS a bit. I don't really think it is good idea to show such PMF data in a Figure wherein the primary MS has not yet been published. Few lines attributing it to as personal communication should be enough. The major results of the current paper do not rest on the PMF analyses, so this should be ok. In case you do retain Figure 8, the units of PMF factors should be explained.

3) The current MS can benefit by including and discussing comparisons with the following relevant studies on OH reactivity measurements from high isoprene concentration sites :

i) Nakashima, Y., Kato, S., Greenberg, J., Harley, P., Karl, T., Turnipseed, A., Apel, E., Guenther, A., Smith, J., and Kajii, Y.: Total OH reactivity measurements in ambient air in a southern Rocky mountain ponderosa pine forest during BEACHON-SRM08 summer campaign, Atmos. Environ., 85, 1–8, doi:10.1016/j.atmosenv.2013.11.042, 2014.

ii) Kumar V. and Sinha V.: VOC–OHM: A new technique for rapid measurements of ambient total OH reactivity and volatile organic compounds using a single proton transfer reaction mass spectrometer, Int. J. Mass Spectrom., 374, 55–63, doi:10.1016/j.ijms.2014.10.012, 2014.

Technical comments:

1) Please mention the temperature and pressure values and list the the rate constants used for determining calculated OH reactivity and CRM OH reactivity (the latter can be added to the supplement).

2) Authors should discuss the potential influence of the boundary layer dynamics on the diurnal variability of OH reactivity, if any? Was the site above the nocturnal boundary layer?

3) Please mention whether the back trajectories consistent with the local wind direction measurements?

Table 2: LOD for GHG and CO measurements is missing

Fig 4: AVOCs % contribution is not legible; How were day and night time hours chosen?

Page 11; Lines 27-30: Please report the rate constants correctly. “x or E” is missing

Page 13: Not clear what is meant here…

“We considered a number of relevant monoterpenes emitted by Mediterranean 12 shrubs, including rosemary which was abundantly surrounding our monitoring station and 13 determined a rosemary-terpenes weighted reaction rate coefficient with OH of 1.56 10-10 cm3 14 molecule-1 s-1 (Bracho-Nunez et al., 2011).”

Last line is not clear, please make it quantitative: “Our results demonstrate the relatively-high observed reactivity and the large impact of biogenic compounds”

Page 4; Line 2: Suggest replacing "....makes a powerful means... " by "is a powerful means..."
Page 6; Equation 2; Xi is missing , only i has been typed

Section 3.2.2: Please mention the efficiency of the photolytic converter used in the NOx analyzer

Page 8; Line 14: “Measurements are corrected for H2O dilution to calculate the molar fractions in dry air”: Please explain how as there are a number of ways that have been reported in the literature

Page 8, Line 17: “Here” is used twice
Page 18; Line 19; Reference Paatero has a typo
Page 12; Line 23: throughout has been spelt as "through"
Page 12; Line28: Should be adsorbent instead of adsorbant
Page 13; Line 8: Typo in spelling of abundantly
Page 13; Line 32: Please correct the incorrect english phrase : ".....associated to its formation..."

Page 11: Line 14and later on as well: What is alpha terpinene? Terpinenes are a class of compounds. Do you mean alpha pinene?
Page 15; Line 23: Please correct english : "...associated to an increase....."

Summary:

I suggest replacing “…technologies” by “… techniques”.