

Accepted Manuscript

Investigation of washout and rainout processes in sequential rain samples

Melike Būşra Bayramođlu Karşı, Serpil Yenisoş-Karakaş, Duran Karakaş

PII: S1352-2310(18)30465-5

DOI: [10.1016/j.atmosenv.2018.07.018](https://doi.org/10.1016/j.atmosenv.2018.07.018)

Reference: AEA 16124

To appear in: *Atmospheric Environment*

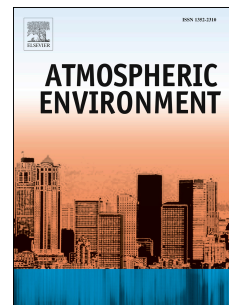
Received Date: 2 January 2018

Revised Date: 3 July 2018

Accepted Date: 9 July 2018

Please cite this article as: Bayramođlu Karşı, Melike.Būş., Yenisoş-Karakaş, S., Karakaş, D., Investigation of washout and rainout processes in sequential rain samples, *Atmospheric Environment* (2018), doi: 10.1016/j.atmosenv.2018.07.018.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Investigation of Washout and Rainout Processes in Sequential Rain Samples

Melike Büşra BAYRAMOĞLU KARŞI¹, Serpil YENİSOY-KARAKAŞ², Duran KARAKAŞ^{3*}

¹Abant İzzet Baysal University, Innovative Food Technologies Development Applications and Research Center, YENIGIDAM, 14030 Gököy/Bolu

²Abant İzzet Baysal University, Faculty of Arts and Sciences, Department of Chemistry, 14030 Gököy/Bolu

³Abant İzzet Baysal University, Faculty of Engineering and Architecture, Department of Environmental Engineering, 14030 Gököy/Bolu

ABSTRACT

In this study rainfall events were sampled sequentially between April and June 2014 (one event in April, two in May and one in June, 2014) in the city center of Bolu province located in the western Black Sea Region of Turkey. Particle size distributions, pHs, major ion compositions and fractional distributions, neutralization factors and washout, rainout identifications were investigated by evaluating the data obtained from the sequences of the rain events. Local wind directions and upper atmospheric three dimensional back trajectory calculations were also used to identify the source regions affecting the receptor site. The primary purposes of this study were to present the effectiveness of washout and rainout processes and to identify the contributions of local and distant source regions to the rainfall events affecting the north western part of Turkey. The average pH values for the subsamples were determined as 5.20 ± 0.47 , 5.51 ± 0.21 , 6.97 ± 0.23 (6.66-7.20) and 6.42 ± 0.16 (6.17-6.66), respectively for the four rain events sampled. Ninety percent of the particles were smaller than $1135 \mu\text{m}$ for the first fraction, $444.5 \mu\text{m}$ for the second fraction, and $0.79 \mu\text{m}$ for the third fraction, respectively. Except for the fourth fraction, sequences of the rain event showed a linear decrease in particle sizes. The highest rainout to washout ratios were observed for nitrate ion (72.4 %) and followed by ammonium ion (63.5%), chloride (48.4%), sulfate (46.3%), magnesium ion (41.5%), and potassium ion (31.2%). Strong correlations of nitrate and sulfate with Ca^{2+} , Mg^{2+} and Na^{+} suggested that the rain droplets were neutralized by these alkaline ions.

Keywords: Sequential rain sampling, Washout, Rainout, Particle size distribution, Major ions

Download English Version:

<https://daneshyari.com/en/article/8863462>

Download Persian Version:

<https://daneshyari.com/article/8863462>

[Daneshyari.com](https://daneshyari.com)