[구GC-21] Enhanced Nitrogen in Morphologically Disturbed Blue Compact Galaxies at 0.20 < z < 0.35: Probing Galaxy Merging Features

Jiwon Chung[1], Soo-Chang Rey[1], Eon-Chang Sung[2], Bum-Suk Yeom[1], Andrew Humphrey[3], Wonhyeong Yi[1], Jaemann Kyeong[2]

[1]Department of Astronomy and Space Science, Chungnam National University, Daejeon 305-764, [2]Korea Astronomy and Space Science Institute,Daejeon 305-348, Korea

[3]Centro de Astrof´ısica da Universidade do Porto, Rua das Estrelas, 4150-762, Porto, Portugal

We present a study of correlations between the elemental abundances and galaxy morphologies of 91 blue compact galaxies (BCGs) at z=0.20-0.35 with Sloan Digital Sky Survey (SDSS) DR7 data. We classify the morphologies of the galaxies as either 'disturbed' or 'undisturbed', by visual inspection of the SDSS images, and using the Gini coefficient and M20. We derive oxygen and nitrogen abundances using the Te method. We find that a substantial fraction of BCGs with disturbed morphologies, indicative of merger remnants, show relatively high N/O and low O/H abundance ratios. The majority of the disturbed BCGs exhibit higher N/O values at a given O/H value compared to the morphologically undisturbed galaxies, implying more efficient nitrogen enrichment in disturbed BCGs. We detect Wolf-Rayet (WR) features in only a handful of the disturbed BCGs, which appears to contradict the idea that WR stars are responsible for high nitrogen abundance. Combining these results with Galaxy Evolution Explorer (GALEX) GR6 ultraviolet (UV) data, we find that the majority of the disturbed BCGs show systematically lower values of the Hα to near-UV star formation rate ratio. The equivalent width of the Hβ emission line is also systematically lower in the disturbed BCGs. Based on these results, we infer that disturbed BCGs have undergone star formation over relatively longer time scales, resulting in a more continuous enrichment of nitrogen. We suggest that this correlation between morphology and chemical abundances in BCGs is due to a difference in their recent star formation histories.