Dust in the Epoch of Cosmic Reionization: a dust-poor galaxy at z=7.2

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Dust formation and evolution in the early Universe is now becoming a hot topic in galaxy evolution studies thanks to ALMA. We have recently observed a young star-forming galaxy at the redshift z=7.2, when Cosmic Reionization was thought to happen, with ALMA. We have successfully detected the [OIII] 88 micron emission line from HII regions in this galaxy, suggesting an oxygen abundance in this galaxy of ~10% of the Sun. On the other hand, no dust continuum emission is detected, contrary to a dust-rich galaxy found at a similar redshift z=7.5. This indicates a very low dust-to-metal mass ratio in the galaxy we observed, namely <20%. We will discuss a physical mechanism why there are dust-poor and -rich galaxies in the early Universe.