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Longyun Ding, School of Mathematical Sciences and LPMC, Nankai University, Tianjin, 300071, Peoples Rep of China, and **Su Gao***, Department of Mathematics, 1155 Union Circle #311430, University of North Texas, Denton, TX 76203. *Non-archimedean abelian Polish groups and their actions.*

We investigate the structure of non-archimedean abelian Polish groups whose orbit equivalence relations are all Borel. Such groups are called tame. We show that a non-archimedean abelian Polish group is tame if and only if it does not involve \mathbb{Z}^ω or $(\mathbb{Z}(p)^{<\omega})^\omega$ for any prime p . In addition to determining the structure of tame groups, we also consider the actions of such groups and study the complexity of their orbit equivalence relations in the Borel reducibility hierarchy. It is shown that if such an orbit equivalence relation is essentially countable, then it must be essentially hyperfinite. We also find an upper bound in the Borel reducibility hierarchy for the orbit equivalence relations of all tame non-archimedean abelian Polish groups.. (Received February 08, 2016)