The Bohr topology on an infinite (discrete) abelian group $G$ is the topology $T^\#$ induced by $\text{Hom}(G, \mathbb{T})$. These facts are known: (a) $(G, T^\#)$ is totally bounded (“precompact”, in the terminology of many authors); (b) $(G, T^\#)$ is not pseudocompact—that is, it is not $G_\delta$-dense in its (compact) Weil completion; (c) $T^\#$ contains every totally bounded group topology on $G$, in particular every pseudocompact group topology.

The authors conjecture that for every abelian $G$ which admits a pseudocompact group topology $\mathcal{U}$, the supremum of the set of all such topologies is $T^\#$. They have established this, so far, in case (1) $G$ is a torsion group, or (2) $\mathcal{U}$ may be chosen so that $\omega \leq w(G, \mathcal{U}) \leq c$. (Received September 23, 2006)