Let's assume there exist group $G$ and its proper subgroups $H$ and $K$ such that $G = H \cup K$. If $H \subseteq K$, then $G = K$ thus we get a contradiction. Therefore $H \not\subseteq K$. Let $h$ be the element of $H \setminus K$, and $k$ be the arbitrary element of $K$. If there exists $k \in K$ such that $hk \in K$, then $h = (hk)k^{-1} \in K$ and we get contradiction. Therefore $\forall k \in K$, $hk \in H$. But then $hk \subseteq H$, which implies that $K = h^{-1}hK \subseteq h^{-1}H = H$ thus $G = H$, however this is impossible since $H$ is a proper subgroup of $G$. Thus there is no such group $G$. □