A character on a group is a positive definite function which takes the identity to 1 and is constant on conjugacy classes. Characters on a finite group give an essential tool for understanding the representation theory of the group and motivated by this Thoma in 1964 initiated the study of characters on infinite groups. In 1966 Kirillov classified all characters on $SL_n(k)$ for $k$ a field and $n > 2$. In my talk I will present the classification for $SL_2(k)$, as well as for $SL_2$ of rings of integers (and their localizations) with infinitely many units. I will also present some applications of these results. (Received January 25, 2014)