Monolayer group-VI transition-metal dichalcogenides (TMDs) have emerged as a new class of two-dimensional semiconductors and attracted extensive research interest due to their sizable direct bandgap, remarkable optical and electronic properties. The tightly bound excitons with giant oscillator strength render monolayer TMDs as an ideal platform to investigate light-matter interaction in strong coupling regimes when they are integrated with optical cavities. By coherently superimposing excitons and cavity photons, the exciton-polaritons based on monolayer TMDs are stable at room temperature with considerable promise towards optoelectronic and valleytronic devices. In this thesis, we mainly investigate on light-matter interactions in monolayer TMDs and microcavities. In the strong coupling regime, the observed characteristic Rabi splitting indicates the formation of microcavity polaritons. Our results not only provide fundamental understanding of the light-matter interactions in the integrated 2D semiconductor and optical cavity system, but also show great promises for the application of polariton devices.