**Abstract:** Cuyu gold deposit, is located in the central Jilin Province and the southeast part of the Central Asian Orogenic Belt between the Siberian Plate and the North China Plate, the southern side of the Zhangguangcailing Block. The strata in Cuyu gold deposit mainly include the upper Carboniferous Shizui Formation and the lower Jurassic Nanloushan Formation. The gold orebodies in Cuyu gold deposit, gold-bearing quartz veins, are mainly controlled by the NW faults. The major ore type is gold-bearing quartz vein. The ore is mainly featured by massive, vein-like, disseminated structures, and granular and metasomatic textures. The alteration types of surrounding rocks mainly include silicification, sericitization, chloritization and carbonation. Among them, sericitization is closely related to gold ore genesis. The main metallic minerals include pyrite, galena, chalcopyrite, sphalerite and arsenopyrite. According to the mineralization and wall-rock alteration characteristics, considering previous studies on other gold deposits in the central Jilin Province (Su et al., 2014; Jing et al., 2017), mineralization process in Cuyu can be divided into three mineralization stages: quartz-arsenopyrite- pyrite stage (I), quartz-polymetallic sulfides stage (II), quartz-calcite stage (III). The quartz grains in different mineralization stages mainly contain three types of fluid inclusions: CO$_2$ aqueous multi-phase (C-type), liquid-rich two-phase (L-type), and vapor-rich two-phase (V-type). The homogeneous temperatures of fluid inclusions in the early stage range from 210°C to 354.9°C, salinities range from 1.9 to 11.6 wt% NaCl equiv. The middle stage (Stage II) is mainly contains liquid-rich two-phase (L-type) and vapor-rich two-phase (V-type). Their homogeneous temperature range from 201°C to 308.2°C, salinities range from 1.1 to 8.1 wt% NaCl equiv. Only liquid-rich two-phase (L-type) inclusions are present in the late stage (Stage III) which homogeneous temperature is from 128°C to 205°C, fluid salinities is from 0.4 to 7.3 wt% NaCl equiv. The ore fluid of first two stages belongs to the medium temperature and low salinity H$_2$O-NaCl-CO$_2$ system, and the fluid of last stage belongs to the low temperature and low salinity H$_2$O-NaCl-CO$_2$ system. These studies on ore-forming conditions, deposit geology, as well as comparison to other such respective gold deposits in central Jilin Province as Haigou, Jiapigou, etc. (Zhang et al., 2011; Dai et al., 2007), indicate that the Cuyu gold deposit can be classified as the mesothermal vein-type deposit.

**Key words:** geological characteristics, fluid inclusion, mesothermal vein-type gold deposit, Cuyu gold deposit, the central Jilin Province

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