^{54}Cr ISOTOPIC ANOMALIES IN THE TAGISH LAKE AND ORGUEIL CARBONACEOUS CHONDRITES. T. H. Luu[1], M. Petitat[2] ,J.-L. Birck[1], M. Gounelle[2]. [1] Laboratoire de Géochimie et Cosmochimie IPG, 4 Place Jussieu 75252, Paris Cedex 05, France. E-mail: birck@ipgp.jussieu.fr. [2] LMCM, CNRS & MNHN, UMR 7202 CP 52, 57 Rue Cuvier 75231 Paris Cedex 05.

Introduction: The stepwise dissolution with increasing acid strengths of bulk rock carbonaceous chondrites liberates Cr with both excesses and deficits in ^{53}Cr and ^{54}Cr [1,2,3]. The goal of this study is to extend the survey of meteorites exhibiting Cr anomalies to Tagish Lake and confirm the previous values obtained for Orgueil.

Experimental Methods: The stepwise dissolution of 0.32g of Orgueil and 0.29g of Tagish Lake followed the previously established procedure described in [1]. The chemical separation of Cr and the TIMS measurements were described in Trinquier et al [4]. All data are expressed in $\varepsilon^{53,54}$Cr values.

Results: *Anomalies in ^{54}Cr:* Each dissolved fraction represents different mineral types from the same meteorite and is anomalous relative to the terrestrial composition. The most easily dissolved fractions show a deficit ranging from -6ε for Orgueil to -16ε for Tagish Lake. In contrast, the more chemically resistant fractions host excesses rising up to 79ε for Orgueil and 139ε for Tagish Lake.

Anomalies in ^{53}Cr: The amplitude of the variation is two orders of magnitude smaller than for ^{54}Cr. Excesses in ^{53}Cr are concentrated in the chemically less resistant fractions, where Mn and Cr are abundant. *Whole rock:* The ε^{53}Cr value measured for the whole rock of Tagish Lake is higher than in Orgueil. On the contrary, the ε^{54}Cr is higher in Orgueil than in Tagish Lake.

Mass dependent fractionation: Preliminary ICPMS measurements show no difference in ^{53}Cr/^{52}Cr relative to the bulk rock and to the laboratory standard within a resolution of 0.3 permil. This indicates the absence of strong evaporation-condensation processes during the formation of these phases.

Discussion: *^{54}Cr variations in the minerals of carbonaceous chondrites:* The pattern of isotopic data for Orgueil is within the range of already published values [1,2,3]. Tagish Lake has nevertheless 2 striking differences relative to the former systematics of carbonaceous chondrites: it displays both the highest excess and the largest deficit in ^{54}Cr suggesting that it is significantly more primitive than the C1s at the reverse of earlier data which rank Tagish Lake as an anomalous CI2 chondrite [5].

Conclusion: We report here the highest ^{54}Cr excess found so far in a silicate fraction of a meteorite. This occurs in Tagish Lake and reinforce the fact that this meteorite is made up of very pristine material (the most pristine of all according to this study) and strengthens suggestions that Tagish Lake may have originated from a comet or a type-D asteroid in a cold region beyond the asteroid belt, where its components could have conserved their pristine signatures.

References: [1] Rotaru M. et al. (1992) *Nature* 358:465-470. [2] Podosek F. A. et al. (1997) *Meteoritics & Planetary Science* 32:617-627. [3] Trinquier A. et al. (2006) *Astrophysical Journal* 655: 1179-1185. [4] Trinquier A. et al. (2008) *Journal of Analytical Atomic Spectrometry* 23: 1565–1574. [5] Brown P. G. et al. (2000) *Science*, 290, 320-323.