A provenance study on the lapis lazuli collection from the Regional Museum of Natural Sciences in Turin

L Guidorzi[1,2], A Re[1,2], D Angelici[3], Q Lemasson[4,5], C Pacheco[4,5], L Pichon[4,5], B Moignard[4,5], L M Gallo[6], E Costa[7], R Cossio[7] and A Lo Giudice[1,2]

[1] Dipartimento di Fisica, Università di Torino, via Pietro Giuria 1, 10125 Torino, Italy
[2] Istituto Nazionale di Fisica Nucleare, Sezione di Torino, via Pietro Giuria 1, 10125 Torino, Italy
[3] TecnArt S.r.l., via Modena 58, 10153 Torino, Italy
[4] Centre de Recherche et de Restauration des Musées de France, Palais du Louvre, 14 quai François Mitterrand, 75001 Paris, France
[5] New AGLAE FR 3506 – Chimie-Paristech/Ministère de la Culture et de la Communication, Palais du Louvre, 14 Quai F. Mitterrand, Paris 75001, France
[6] Museo Regionale di Scienze Naturali, Via Giolitti 36, 10123 Torino, Italy
[7] Dipartimento di Scienze della Terra, Università di Torino, via Valperga Caluso 35, 10125 Torino, Italy

E-mail: alessandro.re@unito.it

Abstract. Studies on the provenance of raw material used in the production of lapis lazuli artifacts can be particularly useful also in confirming or discarding the attributions given in past times by museum curators. In this work, a case study on five pieces belonging to the 19th century "Savoy Collection" of the Regional Museum of Natural Sciences in Turin is presented. The analysis allowed to assess the correctness of a previous Chilean attribution and to assign a provenance for the whole set of samples.

1. Introduction

Lapis lazuli is a semi-precious blue stone widely used since the antiquity. Due to the restricted compositional and physical constrains in which lapis lazuli can form, only few sources of this rock exist in the world [1]; several are located in Asia (for instance Badakhshan in Afghanistan, Pamir Mountains in Tajikistan or the Siberian deposits), but others can be found also in the American continent, e.g. Chilean quarries. The correct provenance attribution of the raw lapis lazuli used to produce artefacts of archaeological and artistic interest can be fundamental to reconstruct old trade routes [2] and can as well reveal non authentic pieces.

A systematic study of this stone, comparing physico-chemical properties of rocks and historical objects, has been carried out at the Physics Department of the University of Turin since 2007 [1, 3-11]. Over the years it was possible to gather a considerable database, analysing both lapis lazuli rocks and artworks, and to define specific provenance markers for the establishment of an analytical protocol for the provenance determination [1]. In particular, only some of the numerous mineral phases present in lapis lazuli are object of study, namely diopside ($CaMgSi_2O_6$), pyrite (FeS_2) and wollastonite ($CaSiO_3$).