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RESEARCH ARTICLE

ARCHAEOMETRIC STUDY OF BEADS AND PENDANTS FROM THE IBERIAN NECROPOLIS OF ALARCOS III (POBLETE, CIUDAD REAL, SPAIN)

Estudio arqueométrico de cuentas de collar y colgantes de la necrópolis ibérica de Alarcos III (Poblete, Ciudad Real, España)

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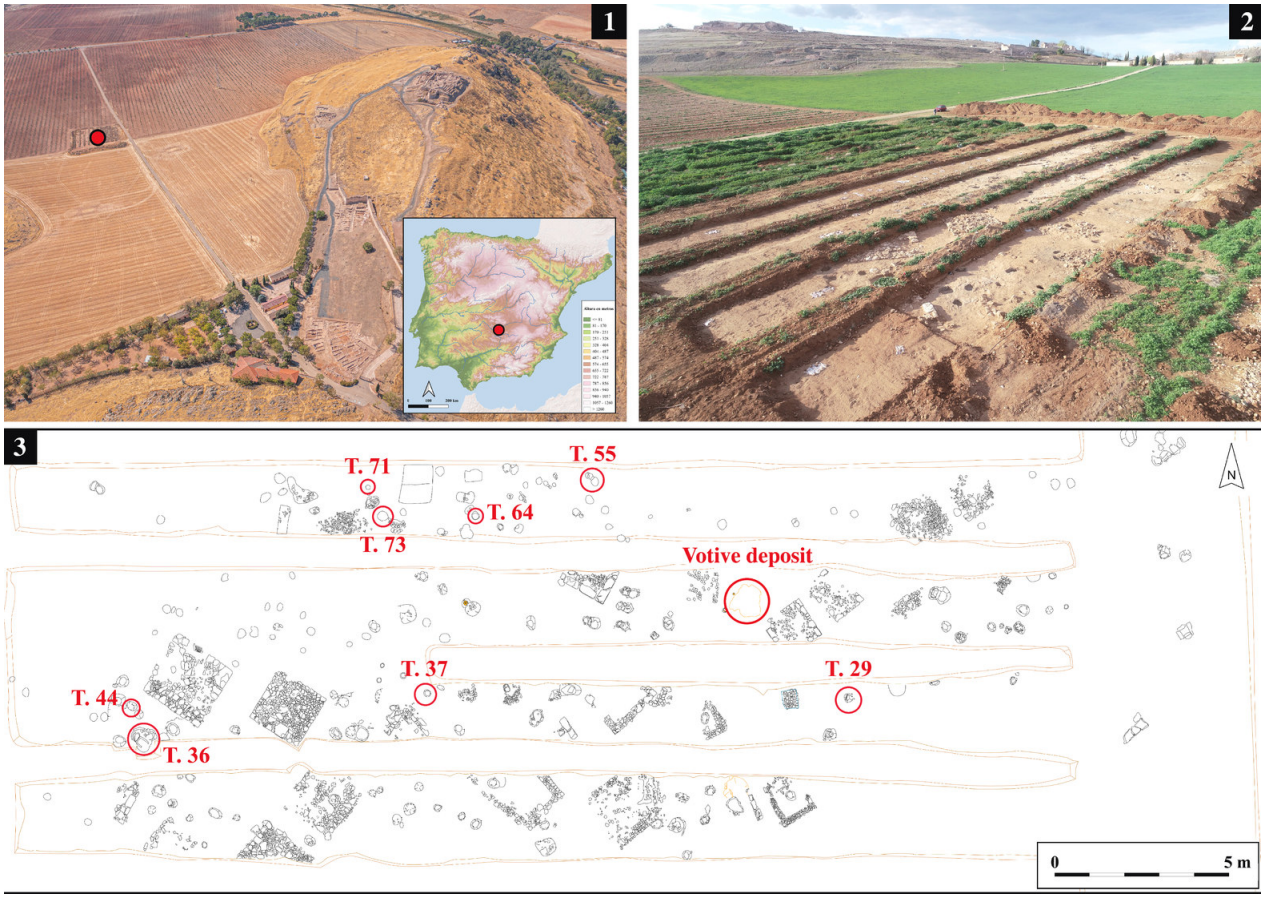

Figure 1. 1) Location of the Iberian necropolis of Alarcos III. 2) Aerial photograph. 3) Planimetry and location of the analyzed tombs.

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ABSTRACT. *This paper presents the typology and archaeometric characterization of a sample of necklace beads and pendants made of amber, sillimanite, glass, quartz, and shell documented in different tombs of the Iberian necropolis of Alarcos III. XRD, SEM-EDX, and FTIR were applied to eleven items dated between the 4th and 1st centuries BCE to determine their mineralogical nature and assess their provenance. The assemblage is notable for the identification of Baltic amber and for the interpretation of orange beads as quartz rather than carnelian.*

KEYWORDS. *Archaeometry, Oretania, Iberian necropolis, XRD, SEM-EDX, FTIR.*

RESUMEN. *Este trabajo presenta la tipología y caracterización arqueométrica de una muestra de cuentas de collar y colgantes de ámbar, sillimanita, vidrio, cuarzo y concha documentados en diferentes tumbas de la necrópolis ibérica de Alarcos III. Se aplicó DRX, SEM-EDX y FTIR a once piezas fechadas entre el siglo IV a.C. y el cambio de era para determinar su naturaleza mineralógica y evaluar su procedencia. En el conjunto destaca la identificación de ámbar báltico y la interpretación de cuentas anaranjadas como cuarzo y no como cornalina.*

PALABRAS CLAVE. *Arqueometría, Oretania, necrópolis ibérica, DRX, SEM-EDX, FTIR.*

1. INTRODUCTION

In studies of Iberian funerary assemblages, elements such as ceramics—whether imported or indigenous—and weaponry have traditionally attracted most scholarly attention, whereas other ornaments such as necklace beads and pendants have remained in the background despite their considerable informative potential. In the southern Meseta, this omission also contributes to distorting distribution maps in which inland areas appear artificially "empty" of bead finds (Ruano 1996).

The aim of this paper is to present the beads and pendants recovered from Necropolis III of Alarcos (Poblete, Ciudad Real) in the tombs excavated between 2021 and 2023. To this end, the distribution of beads and pendants across the necropolis is described, considering their uneven presence among tombs, and the pieces are typologically and technologically characterized through macroscopic study and the application of archaeometric techniques to eleven samples. Likewise, the diffractograms, SEM photographs, EDX mappings, and infrared spectra for each support type (amber, quartz, glass, and possible sillimanite) are included.

2. TERRITORIAL AND ARCHAEOLOGICAL FRAMEWORK

Until recently, only six tombs dated between the 7th and 6th centuries BCE were known from the oppidum of Alarcos (Ciudad Real), located in the lower part of the southeastern slope, an area that was reconfigured around the 4th–3rd centuries BCE as a habitation space (Fernández & García 1998). In 2012, a necropolis was identified on the northern slope of the hill, and twenty-five tombs dated between the 3rd and 1st centuries BCE were documented; after years of study, these became the subject of a monograph (García *et al.* 2018). In 2018, the third necropolis of the site was discovered, known as the Iberian necropolis of Alarcos III (Figure 1). However, systematic excavation did not begin until 2021. Although the site is still under excavation and study, some of the most outstanding assemblages and finds from the earlier phase (4th–3rd centuries BCE) have already been published, such as an offering deposit containing a remarkable number of Attic ceramics and glass unguentaria dated to 380–370 BCE (Miguel-Naranjo *et al.* 2025), and a burial from the second quarter of the 4th century BCE in which the remains of an elderly woman were deposited in an Attic krater attributed to the Retorted Painter (Miguel-Naranjo *et al.* 2024).

However, most of the excavated tombs belong to the Iberian-Roman phase (2nd century BCE–1st century CE). Among them, several burials stand out in which Iberian ceramics with complex decoration have been documented (Rodríguez-Rabadán & Miguel-Naranjo, in press). The most common burial type at this stage is a double pit with a central slab—as opposed to the usual simple pits of the preceding phase. In both periods, grave goods are usually varied, although chalice-shaped vessels, iron weapons, and a wide variety of fibulae and ornaments are abundant; these were occasionally placed inside the urn, such as fibulae and necklace beads.

3. MATERIALS AND METHODS

Of the ninety-one necklace beads exhumed in the Iberian necropolis of Alarcos III between 2021 and 2023,

Table 1. Morphology of the necklace bead and pendant types identified in each tomb.

INVENTORY N.º		MATERIAL / UNITS	SHAPE	COLOR	MEASURE (in mm)			WEIGHT (in g)
Tomb n.º	Sample n.º				∅ Bead	Thickness	∅ Perforation	
T. 29		Glass / 1	Trapezoid	Green	11.24	3 – 8	1.80	0.39
		Glass / 32	Circular	Blue	1 – 3	0.6	1.30	0.02
	M.1	Amber / 1	Cylindrical	Orange	10.33	7.05	Ind.	0.13
T. 36		Quartz / 3	Biconical	White	14 – 21	11	3	3.04
		Quartz / 1	Ovoid	White	17	6	2	1.85
		Shell / 1	Circular	Brown-Gray	14	16	2	1.83
T. 37		Glass paste / 3	Ovoid	Silver-plated	8 x 6	1.5	2.10	0.28
T. 44	M.2	Glass / 13	Circular	Blue	2.94	0.66	2.14	0.01
	M.3	Sillimanite / 1	Fusiform	Red	18.74	5.72 – 6.18	2.54	0.90
T. 55		Glass paste / 1	Tubular	Blue	10	5	2	0.16
		Quartz /1	Cylindrical	White	14	11	2	3.01
T. 64	M.4	Glass / 1	Circular	Blue	2.65	0.87	1.35	0.01
T. 71	M.5	Glass / 1	Circular	Golden	4.5	0.75	3.75	0.02
T. 73		Glass / 10	Circular	Golden	4.95 – 5.5	1.6	3.3	0.01
	M.6-11	Quartz / 26	Cylindrical	White, White-Orange and Orange	5 – 16	7.5 – 10	2-3	0.30 – 2.85
Deposit		Glass / 1	Circular	Blue	Ind.	0.6	Ind.	0.01

eleven specimens were selected from five tombs that represent the range of documented support materials (Table 1 and Figures 1–2). Their characterization was based on the following techniques:

X-ray diffraction (XRD) was used to identify crystalline phases and to determine whether the pieces were amorphous or crystalline. Although the ideal procedure is to analyze powder (< 50 µm), analyses were carried out both on powder and on complete pieces when the surface was sufficiently flat. The instruments used were a Philips X'Pert MPD diffractometer, with a ceramic tube and copper anode, Kα1 radiation = 1.54056 Å, programmable divergence slit of 12.5 mm, goniometer (precision 0.001° 2 Theta), 12.5 mm anti-scatter slit, 0.1 mm receiving slit, graphite monochromator for CuKα1, and sealed proportional gas detector (Xenon). A Bruker D8 Advance A25 diffractometer was also used, with a long fine-focus Cu anode tube, Kα radiation = 1.5418 Å, vertical Theta-Theta goniometer, Twin-Twin configuration in a single device as a single unit, and automatic switching between Bragg-Brentano (focused) and Parallel Beam (Göbel mirror) geometries.

Secondly, electron microscopy and EDX microanalysis (SEM-EDX) allowed observation of surface morphology and determination of elemental composition by means of the characteristic X-rays emitted by the sample. Although EDX can provide quantitative point results, it is interpreted mainly qualitatively because it analyzes very small areas (~0.5 mm^2) and depends on the measured point. The instrument used was a HRSEM Zeiss GeminiSEM 500 field-emission microscope, with high resolution at any voltage (between 0.02 and 30 KV), high-contrast imaging of any sample up to 32K × 24K pixels, current intensity between 3 pA and 20 nA, and magnification of 50–2,000,000. EDS microanalysis was performed with an 80 mm^2 Oxford detector with advanced packages (energy-dispersive spectroscopy).

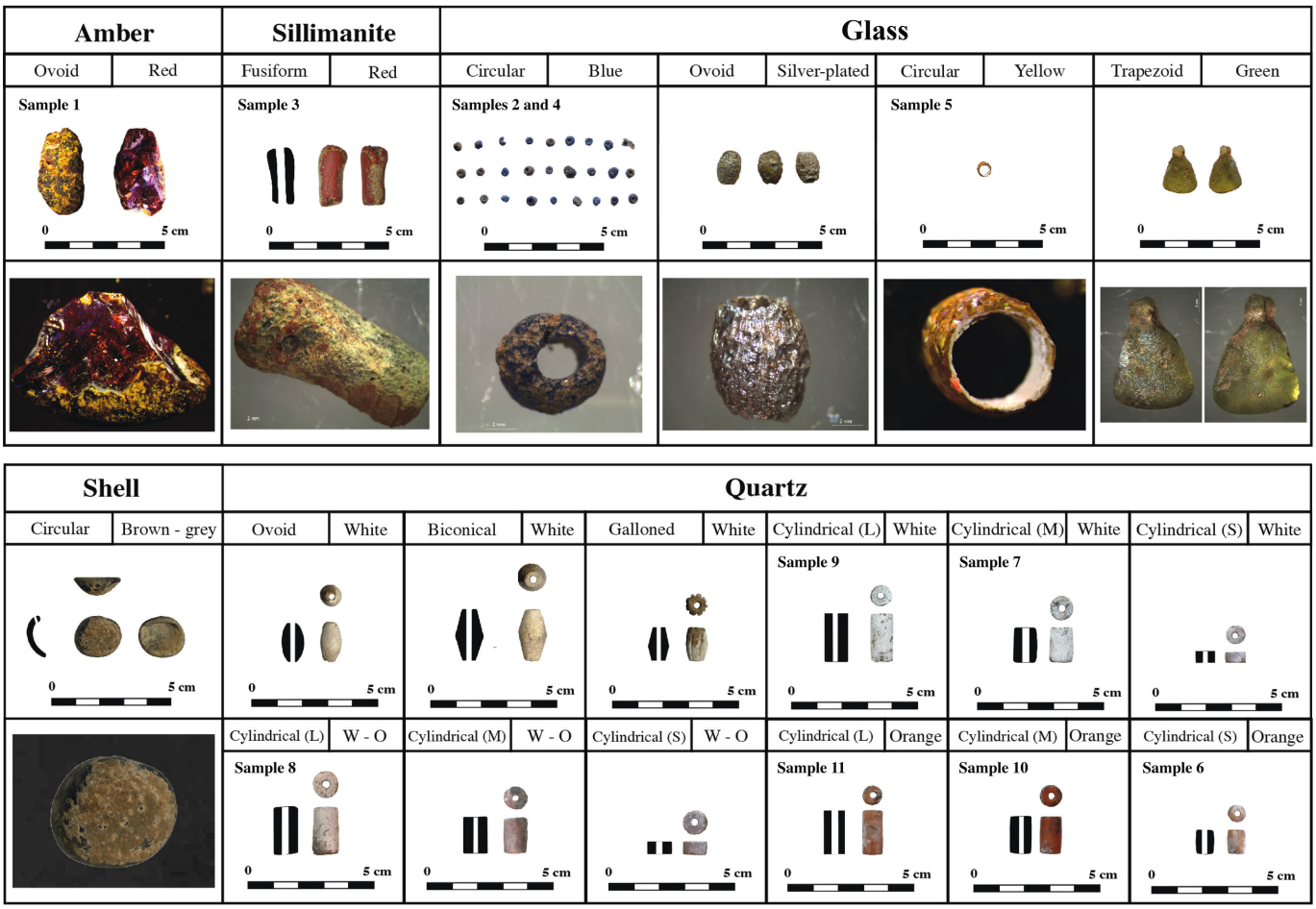

Figure 2. Typology of the necklace beads and pendants from the necropolis of Alarcos III.

In addition, ATR Fourier Transform Infrared Spectroscopy (FTIR) was used to identify functional groups and bonds at the molecular scale, being especially useful for organic compounds and applicable to inorganic components. FTIR constitutes a reference method in infrared spectroscopy because it is non-destructive, faster than traditional procedures, and provides greater analytical sensitivity and precision. The use of FTIR in ATR mode constitutes an ideal method for the analysis of heritage materials, avoiding spectral transformations caused by specular reflection that affect reflectance measurements described in micro-FTIR studies of archaeological glass (Barroso-Solares *et al.* 2026: 6–8).

For this purpose, a Shimadzu IRAffinity-1S-WL C/LabSolution spectrometer was used, with a mid-band infrared lamp (4000–500 cm^{-1}), DTGS Standard detector, and ZnSe ATR crystal. The standard parameters were 45 acquisitions at a resolution of 4 cm^{-1}.

Finally, photographic documentation was carried out using a stereomicroscope equipped with transmitted and reflected light devices, with seven zoom ratio settings (0.8× to 5.6×), together with a high-resolution Olympus SC30 digital camera accessory with a CMOS sensor.

4. RESULTS

4.1 Amber: Sample 1 (Tomb 36)

XRD shows an amorphous background compatible with amber, together with peaks attributable to inclusions/associated minerals. FTIR, in turn, presents diagnostic features that make it possible to distinguish Baltic amber (succinite) from other ambers.

A characteristic band around 880–890 cm^{-1} and the so-called "Baltic shoulder" in the 1200–1300 cm^{-1} region can be recognized, features used in the literature to identify succinite. Consequently, the piece is identified as Baltic amber (Figure 3).

The transformation of amber into an ornamental object can be integrated into operational chains comparable to those of other precious worked materials such as ivory and gemstones. This suggests production linked to generalist workshops rather than to workshops

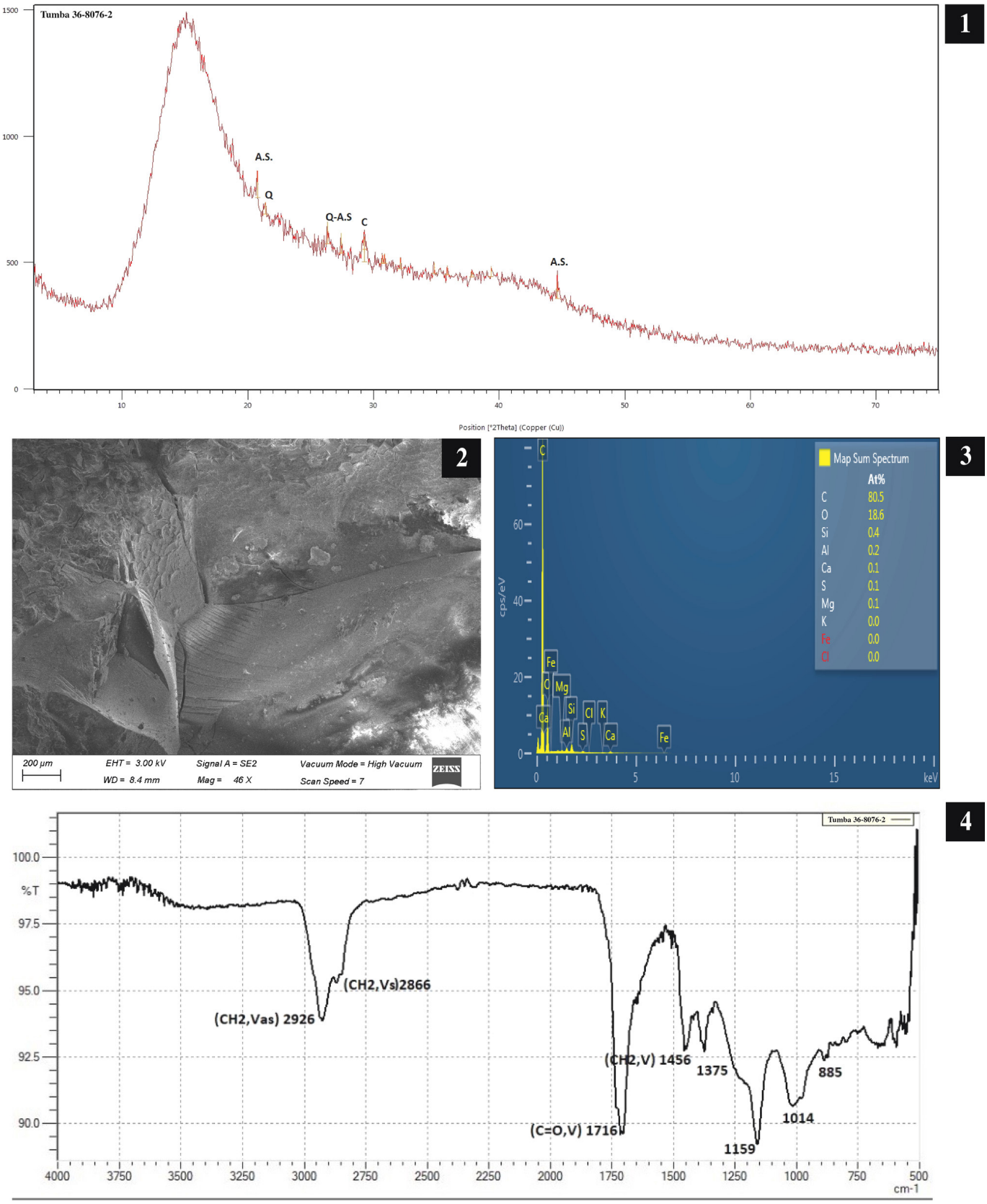

Figure 3. Sample 1: 1) diffractogram, 2) SEM photograph, 3) EDX mapping, 4) infrared spectrum.

specialized exclusively in amber (Warden 1994; Waarsenburg 1995). The technical processes would have included removal of the natural crust, cutting, abrasion, and perforation, with the use of water as a coolant/lubricant to prevent softening caused by friction; the traces of manufacture described in prehistoric assemblages also reveal filing, incisions, abrasion striations, and fine polishing, which could culminate in

complex settings (Kornbluth 2010). Within this framework, the orange bead identified as Baltic amber is interpreted as an object of high value because of its rarity, aesthetic qualities, and technical cost. Its precious value is confirmed, for example, by the presence of Baltic amber in funerary contexts such as the necropolis of Herrería (Molina de Aragón, Guadalajara), dated to the 11th–10th centuries BCE, despite the existence of nearby outcrops (Cerdeño *et al.* 2012).

Determining provenance is crucial for discussing exchange routes because, although many European pieces were traditionally attributed to the Baltic, archaeometric studies have also confirmed the existence of Iberian amber. Iberian Cretaceous specimens tend to show poorer suitability for carving (greater fragility and lower transparency) than Baltic amber (Álvarez *et al.* 2005). In Tomb 36 at Alarcos, the amber bead is associated with imports such as a Punic scarab and imported ceramics; taken together, these are interpreted as indicators of the deceased's high status. Regarding its arrival in the Meseta, it is likely that it was introduced through circuits controlled by Punic agents, linked to southeastern Iberia, the Strait, and the Gulf of Cádiz. Indeed, parallels such as Quinta do Estácio (Barros de Beja, Portugal) (Pereiro *et al.* 2017: 320) show associations between amber and Phoenician-Punic imports, while other authors suggest that it reached the Iberian Peninsula indirectly and through Mediterranean routes from the Early Iron Age onward (Vilaça *et al.* 2002: 77).

4.2 Sillimanite: Sample 3 (Tomb 44)

XRD identifies an aluminosilicate phase compatible with sillimanite/metasillimanite. Surface elemental analysis also detects, in addition to Si–O–Al, a significant presence of carbon and other elements that suggest a possible coating or surface treatment (an interpretation consistent with the organic bands observed in FTIR). The bead stands out because of its rarity as a raw material for ornament in Iberian contexts and requires specific regional comparison (Figure 4).

From a technological point of view, sillimanite is a hard and resistant material whose transformation into a bead implies abrasion, polishing, and perforation using techniques like those employed for other hard stones. However, its selection does not appear to derive from common availability, as in the case of quartz, but from a particular choice, perhaps because of its color, sheen, or the connotations associated with the observed surface treatment (possible chromatic intensification). Given its singularity, interpretation must remain cautious: the solid data are the mineralogical identification and the probable presence of an organic component associated with the surface.

Sillimanite-fibrolite is an unusual support material for beads, so its identification provides a case of special interest because of its fusiform morphology and color. The scarcity of parallels may be influenced by the limited number of analyses applied to ornaments in the Iberian bibliography, where the documented examples are concentrated in contexts of recent prehistory (Orozko-Köhler 2005; Beguiristain 2009; among others), although a Tartessian ceramic piece with sillimanite has also been documented at Ategua (Córdoba) (Barrios *et al.* 2010). One of the areas where the greatest similarities can be observed between the geological materials and the studied sample is the zone encompassing both sides of the Guadarrama range (Fúster & Villaseca 1987). Although similarities are also observed with the complexes of the Serranía de Ronda (Aguayo *et al.* 2006), as well as in Galicia, northern Portugal, Cantabria, the Pyrenees, Gerona, Castellón, and Alicante.

4.3 Glass: Samples 2 (Tomb 44), 4 (Tomb 64), and 5 (Tomb 71)

XRD indicates a predominantly amorphous material (vitreous matrix), consistent with glass. In SEM, features of artisanal manufacture can be observed (surface irregularities, microfractures, and textures compatible with shaping and cooling processes). EDX confirms a silica-based composition with additives, and in pieces with a golden or bicolored finish, compositional differences are detected on the surface (including a greater carbon signal), compatible with coatings/pigments or differentiated surface treatments. The dominant assemblage consists of blue microbeads of millimetric dimensions with very fine perforation, implying equally fine threading elements and great fragility (Figure 5). Nevertheless, the results obtained reinforce the impression of structurally acceptable glass preservation, like that observed in the Pintia collection, where 98% of the pieces showed signs of an intact glass network (Barroso-Solares *et al.* 2026: 1314).

Technologically, this group suggests a standardized production horizon in which shape and size respond to efficient technical routines, such as possible production by segmentation of drawn tubes or by winding on a fine mandrel. Their frequent fragmentation is con-

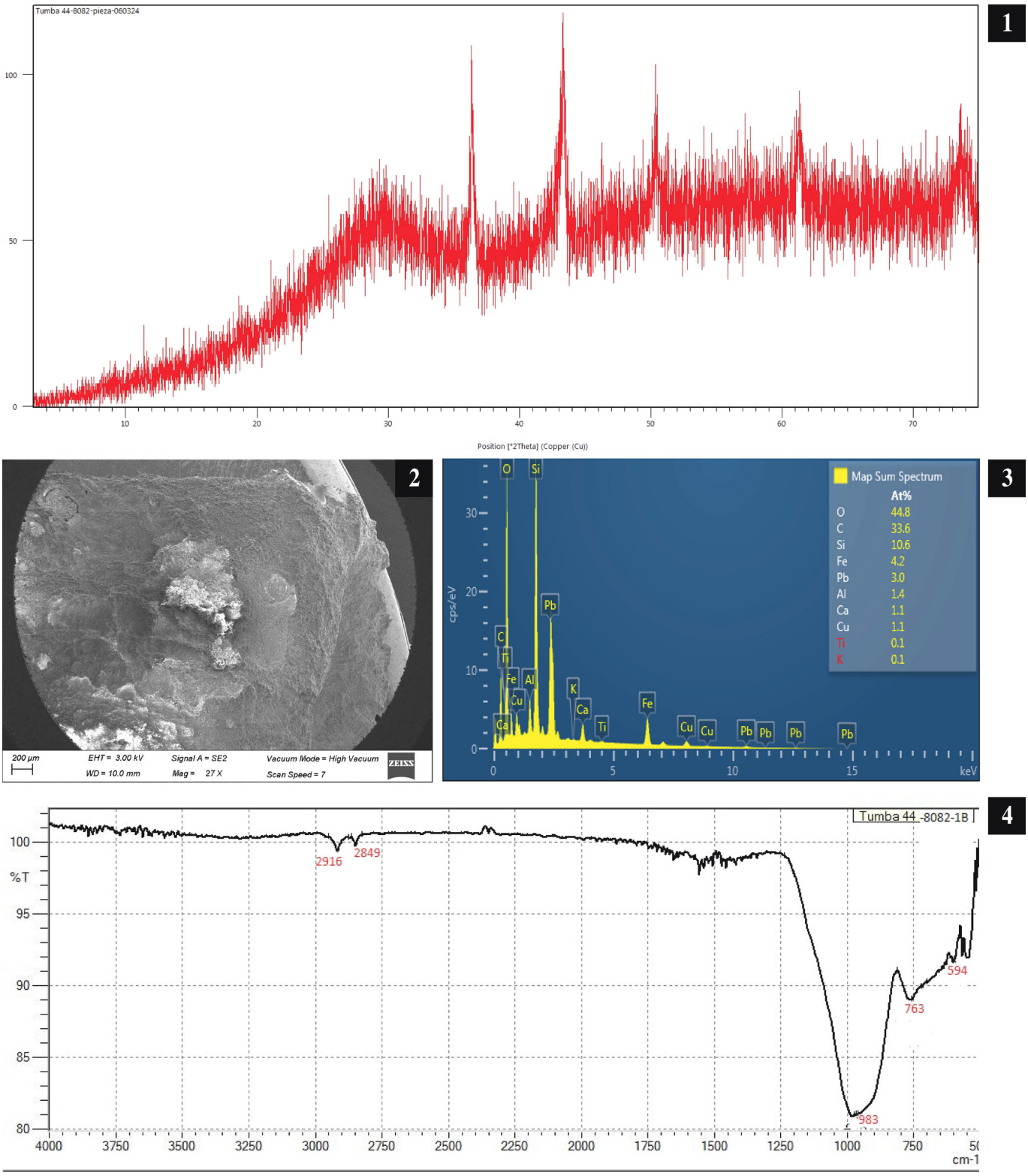

Figure 4. Sample 3: 1) diffractogram, 2) SEM photograph, 3) EDX mapping, 4) infrared spectrum.

sistent with thin walls and an intense use-life prior to deposition. At the methodological level, it has been noted that chemical analyses of these pieces do not always allow robust inferences of provenance because of alteration/degradation and cleaning or restoration treatments. Although they are useful for materially characterizing the support and reducing misleading macroscopic classifications (Palomar *et al.* 2009).

Technologically, glass—silica with alkaline fluxes (Na/K), lime, and chromophore additives—could be produced in suitable furnaces once the technique had been mastered. In this regard, the existence of Western

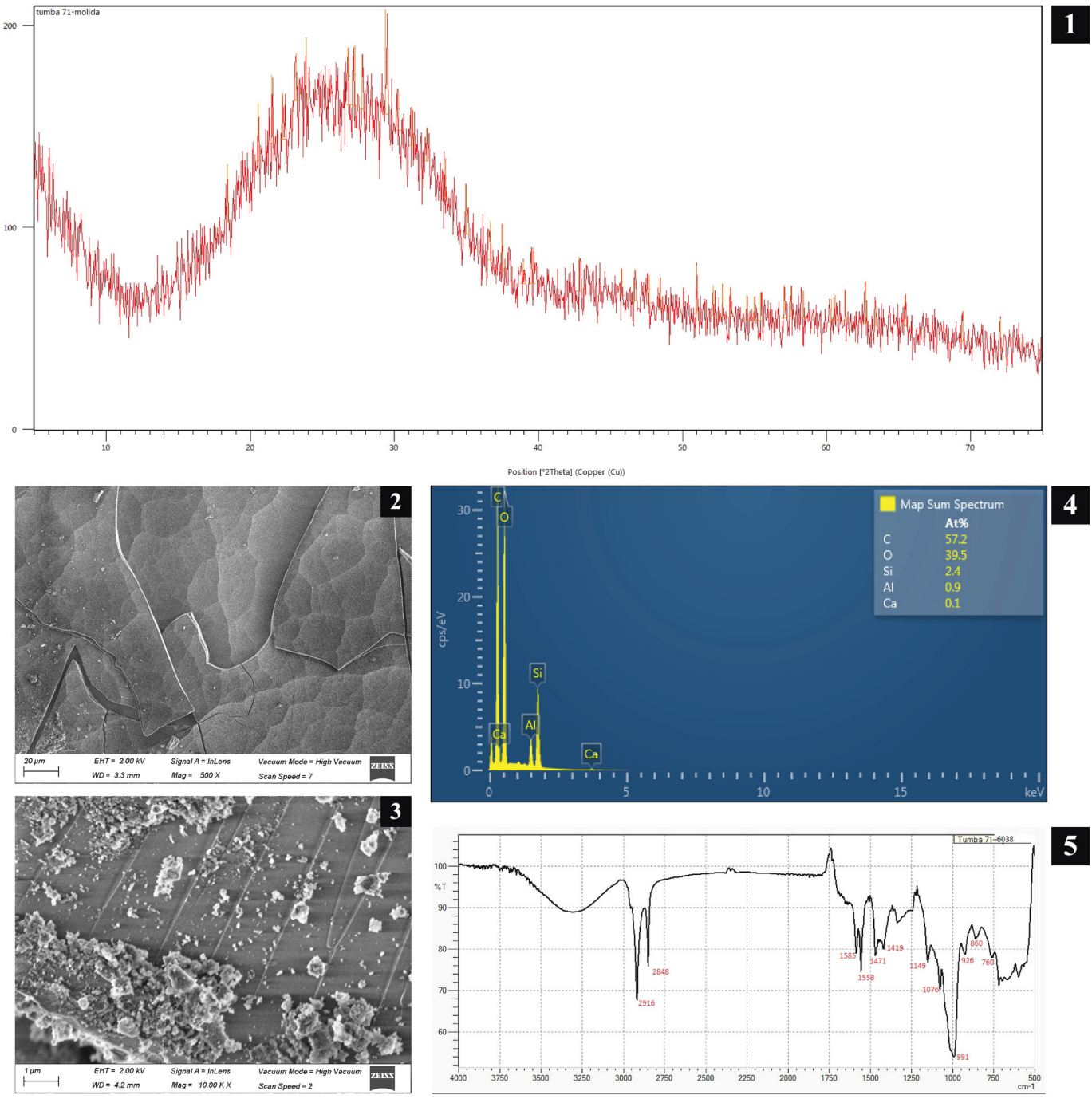

Figure 5. Sample 5: 1) diffractogram, 2) SEM photograph, 3) EDX mapping, 4) infrared spectrum.

craft traditions linked to spheres with strong Phoenician influence from the late 9th century BCE onward has been proposed (Spanò 1998; Di Stefano 2002).

In the Iberian necropolis of Alarcos III, these beads are the most abundant and appear in burials of both men and women—adults and children—as well as in an offering deposit. This coincides with patterns observed in other Iberian necropolises where their use is not strictly discriminatory (Pinto *et al.* 2021: 173), although they appear somewhat more frequently in female contexts (Ruano 1995; Ruano *et al.* 1995). This issue is particularly relevant in our view, considering, moreover, that various studies have pointed out that glass beads constitute prestige goods in Iberian protohistory. In many cases, being imported products, they attest to the existence of exchange networks with other areas of the Mediterranean (Pinto *et al.* 2021: 170–171).

On the other hand, their discovery, together with spindle whorls in several tombs, reproduces associations already noted in Necropolis II of Alarcos (García *et al.* 2018). In general, it is common to document this type of piece at many sites on the Iberian Peninsula and the

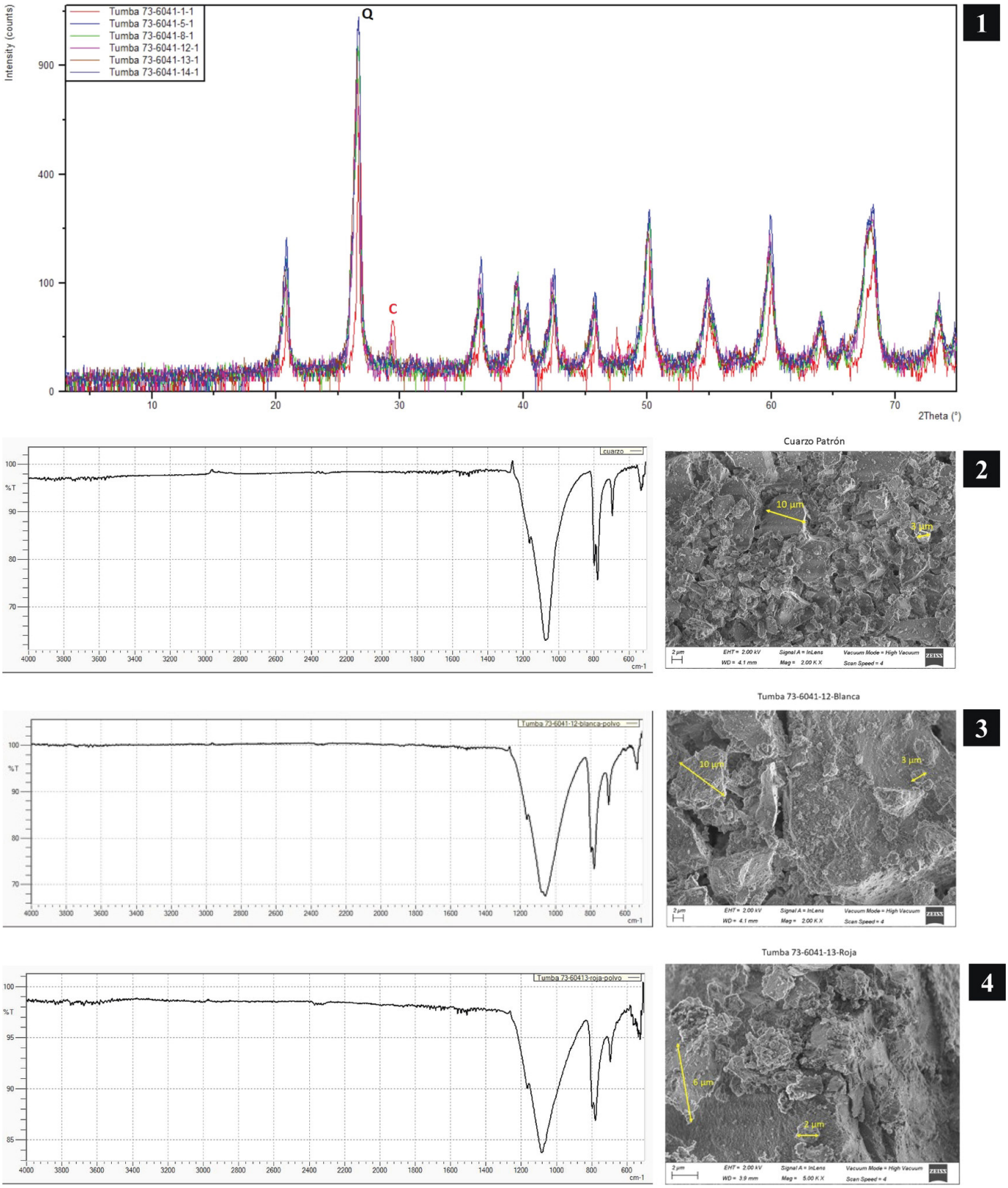

Figure 6. Samples 6 to 11: 1) diffractogram of all samples, 2) infrared spectrum and SEM photograph (quartz standard), 3) infrared spectrum and SEM photograph (sample 9), 4) infrared spectrum and SEM photograph (sample 10).

Balearic Islands from the Early Iron Age onward, such as La Fonteta (Guardamar, Alicante) (Martínez & Vilaplana 2014), La Peña Negra (Martínez & Vilaplana 2014), or Puig des Molins (Ibiza), among others (Ruano 1996). Their distribution during this period also includes inland areas, such as the Portuguese necropolis of Vinha das Caliças (Beja, Portugal), where 794 simple cobalt-blue glass beads like those of Alarcos were docu-

mented. Although in this case they were found only in female and child burials (Arruda *et al.* 2017). These productions continued in Iberian culture, as attested by sites such as La Covalta (Albaida, Valencia) (Vall 1971), La Bastida de les Alcusses (Moixent, Valencia) (Bonet & Vives-Ferrándiz 2011), and the necropolis of Les Casetes (Villajoyosa, Alicante) (Grau *et al.* 2022). At this last necropolis, anthropological studies make it possible to associate these glass beads with female and child tombs.

A few years ago, Verdú (2014), in her study of the necropolis of La Albufereta, suggested that the large number of finds of glass beads throughout the central-western Mediterranean indicated a standardized production accepted among indigenous communities. However, more archaeometric studies of these pieces are needed to establish places of manufacture. The distribution of glass necklace beads on the Iberian Peninsula during the Second Iron Age shows a greater density along the Atlantic and Mediterranean littorals; their presence becomes less frequent toward the inland regions, although we do have several Mesetan sites with notable concentrations of glass elements, such as the Vaccean city of Pintia, where more than 1,000 necklace beads have been recovered (Sanz *et al.* 2024: 87). For the production of this type of bead, its origin has been placed in the Syro-Palestinian area and Egypt, as well as its subsequent redistribution by Phoenician agents (Barroso-Solares *et al.* 2026). In this sense, the archaeometric analyses carried out at the latter site have pointed to major similarities with glasses manufactured in Mesopotamia and Egypt, as well as with Phoenician-Punic traditions (Sanz *et al.* 2024).

4.4 Quartz: Samples 6 to 11 (Tomb 73)

XRD identifies quartz (SiO_2) in all the analyzed pieces from Tomb 73, including the orange-toned specimens. Microstructural comparison and EDX do not allow, based on the available evidence, an attribution to carnelian (a cryptocrystalline variety) in the orange beads: they are interpreted as quartz with chromatic variability, possibly due to traces and/or microinclusions that cannot be robustly resolved by surface EDX in all complete pieces. In several beads, a crust or concretion of calcite attributable to post-depositional processes can be observed, which may also affect readings based solely on external appearance (Figure 6).

This result is methodologically significant, since in many assemblages any orange or reddish bead is automatically labeled as carnelian using only visual criteria. Here, the combination of XRD and microstructural observation requires that attribution to be corrected. In social terms, quartz is not exotic in origin, but it may nevertheless have entailed a high technological cost, since perforating and polishing hard stone requires time, abrasives, and skill, which fits with its preferential association with select tombs.

Quartz is a ubiquitous and highly resistant mineral, with numerous macro- and cryptocrystalline varieties that cover a broad chromatic spectrum (Galán & Mirete 1979; García & Galán 1985). However, quartz beads are relatively scarce in Iberian contexts, probably because of their technological cost, especially perforation, which increases their relative value as ornaments (Garrido 2015). Moreover, despite geological availability on the Iberian Peninsula, there is evidence for the circulation of quartz beads in Mediterranean exchange networks, such as their presence in Punic cargoes (Arribas *et al.* 1987). This obliges us to consider mixed scenarios of local procurement and/or medium- to long-distance distribution. In Necropolis III, in the three tombs where they appear, they are associated with spindle whorls, and two of these tombs are very rich in number and variety of objects (Table 1), especially Tomb 73, where twenty-six quartz beads were recovered.

4.5 Shell (Tomb 36)

In Tomb 36 we identified a perforated marine bivalve (*Glycymeris glycymeris*) that can be interpreted as a pendant (Figure 2). It was associated with other shells showing thermal alteration, which reinforces a symbolic-ritual interpretation, especially because of its deposition in an inland area far from the coast. Perforated shells in Iberian funerary contexts are usually interpreted as ornaments or amulets, with parallels in various necropolises (Pascual 2014). Moreover, in Tomb 36, its association with a perforated scarab and with glass, quartz, and amber beads allows us to propose, cautiously, that they may have formed part of the same necklace.

5. CHRONOLOGICAL CONSIDERATIONS

The reading of the funerary contexts analyzed in this paper makes it possible to observe the long duration of necklace beads and pendants as funerary grave goods in the Iberian necropolis of Alarcos III. The earliest con-

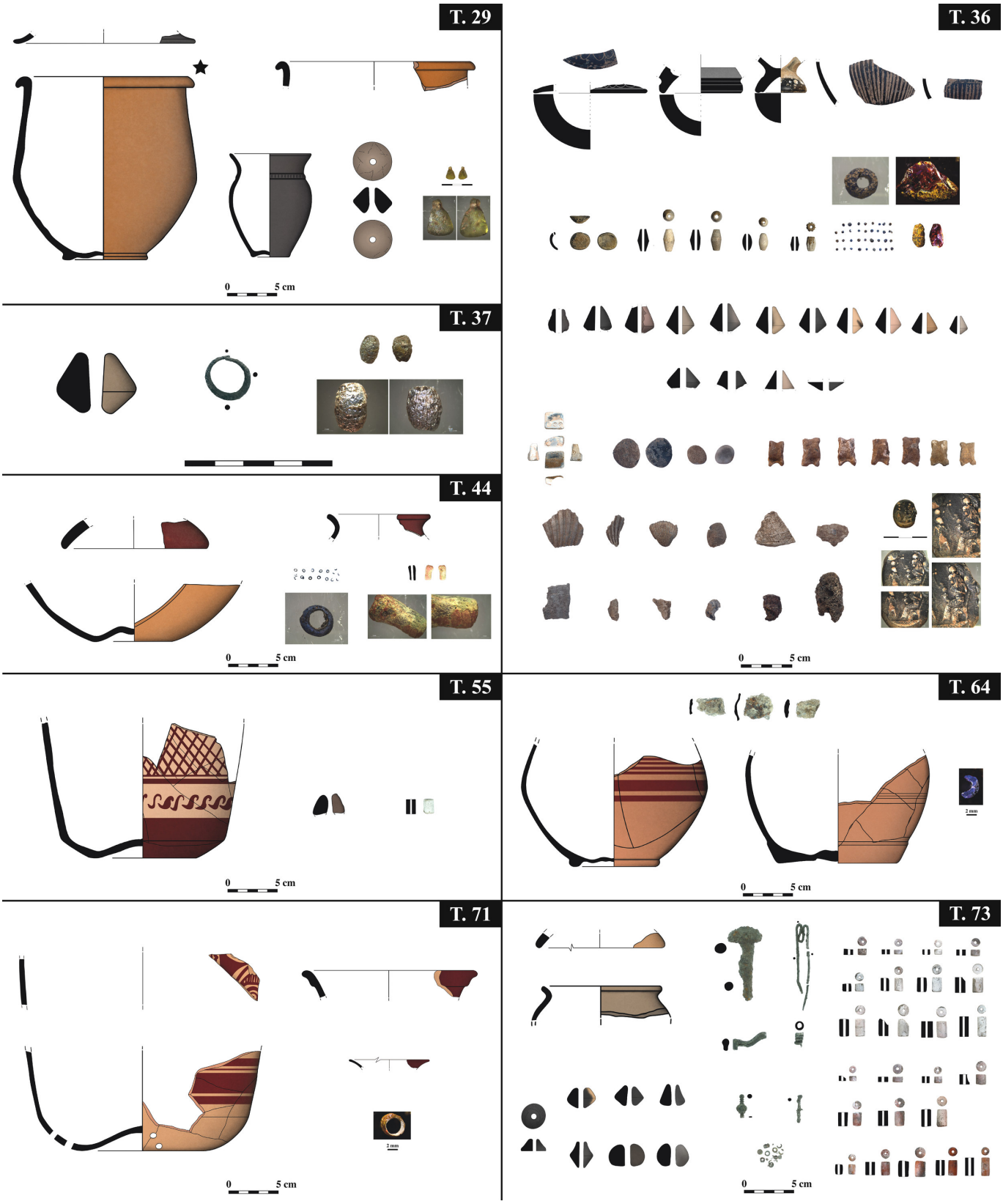

Figure 7. Grave goods from the tombs containing the beads and pendants analyzed in this study.

text with necklace beads is the offering deposit, dated to 380–370 BCE based on its imports (Miguel-Naranjo *et al.* 2025). This is followed by Tomb 36, dated between the end of the 4th century and the beginning of the 3rd century BCE thanks to a painted Gnathia-style kantharos and a Punic scarab (Miguel-Naranjo *et al.* 2023). In the remaining cases, fragmentation and the absence of imports prevent precise dating, so tombs 37,

44, and 64 may reasonably be placed between the 2nd–1st centuries BCE and the turn of the era. This is based on their stratigraphic position and their formal relationship with other burials from the Iberian-Roman phase.

In this sense, for Tomb 55, the chronology is supported by Iberian-Roman painted pottery that may be assigned to the Upper Guadiana II Group (AG-II), dated between the second half of the 1st century BCE and the turn of the era (Rodríguez-Rabadán & Miguel-Naranjo, in press). In this tomb, the lower half of a possible *kalathos* (A.II.7) or jar (A.II.10), according to Mata and Bonet (1992), was documented as a cinerary urn, with a main reticulated frieze and a secondary one with "SSS." For its part, Tomb 71 contained the remains of another possible *kalathos* or jar with traces of a vegetal composition characteristic of Iberian-Roman painted pottery productions of the Segura Group (CPI-S) and Hellín-Lezuza Group (CPI-HL) defined by Martínez (2024).

Likewise, in Tomb 29 we documented a cinerary urn characteristic of the Oretanian Iberian-Roman funerary world and, specifically, of the Upper Guadiana. This type of urn is well represented in other nearby necropolises, particularly at Camino del Matadero (Alhambra, Ciudad Real) (Madrigal & Fernández 2001). At Alarcos, its recurrent association with fine-walled beakers of Mayet types III and IIIB justifies dating tombs 29, 55, and 71 between the middle and the end of the 1st century BCE and the turn of the era.

According to the current evidence, blue glass beads formed part of the funerary assemblage and of the offerings in the oldest funerary contexts recorded to date, such as the aforementioned offering deposit. In this deposit, the presence of eight glass unguentaria, traditionally attributed to eastern Phoenician-Punic workshops or to western centers under strong Phoenician-Punic influence (Di Stefano 2002: 17), suggests that they arrived together from these workshops. This bead type continued to be included in funerary assemblages throughout the 4th and 3rd centuries BCE, together with others made of amber, quartz, or shell, and even survived with new yellowish hues in the Iberian-Roman period.

Whereas during the Middle Iberian period (4th–3rd centuries BCE) blue glass beads were exclusively circular and small, from the 2nd century BCE onward the introduction of new vitreous models can be observed: small circular yellow beads (Tomb 71), silver ovoid beads (Tomb 37), and greenish trapezoidal pendants (Tomb 29). A similar pattern can be observed in quartz beads: whereas the quartz beads from Tomb 36 (late 4th–early 3rd century BCE) show more complex forms (ovoid, biconical, and grooved), those from the Iberian-Roman tombs are cylindrical, differing only in size. These new models introduced in the Iberian-Roman period may be related to the arrival of Rome in the interior regions of the Iberian Peninsula, altering previous trade routes and incorporating new tastes and productions into the indigenous population.

6. CONCLUSIONS

The archaeometric analysis of necklace beads and pendants from the Iberian necropolis of Alarcos III underlines the importance of combining macroscopic observation with XRD, SEM-EDX, and FTIR to identify materials and correct attributions based solely on appearance. Particularly noteworthy in this regard are the detection of Baltic amber and the interpretation of several orange beads as quartz—and not as carnelian. Also, the characterization of the glass beads and the identification of a possible sillimanite specimen, an uncommon support material. These results reinforce the need to incorporate comparable archaeometric series, since surface alteration and post-depositional processes may mask diagnostic features and distort typological or provenance-based interpretations if one works only with visual criteria. Moreover, Barroso-Solares *et al.* (2026: 2–3) explain that protohistoric glasses are unstable materials, prone to dealkalinization, fracturing, and loss of transparency, which conditions both their preservation and their archaeometric interpretation.

In terms of social representation, this type of object appeared in female tombs (29 and 37), child tombs (44), and male tombs (55), as well as in the offering deposit, following a common pattern already detected in other Iberian necropolises. Beads and pendants formed part of a grammar of prestige: they signaled rank within the group and made visible access to resources (Rueda *et al.* 2016). A clear reference point for this logic is the tomb of the Lady of Baza, whose iconographic program underlines the accumulation of jewels as an aristocratic code of wealth and power (Rísquez & Luque 2007; Aranegui 2010). In addition, complementing the previous function, a possible apotropaic role has also been proposed for these pieces, especially in relation to child and female individuals (Pinto *et al.* 2021: 123–124). In Necropolis III, the unequal concentration of these objects and their association with imports or with the scarce Iberian ceramics bearing complex decoration

express an archaeological reality attested in numerous pre-Roman necropolises such as Las Ruedas de Pintia. Here, glass beads appear mostly in notably rich tombs (Sanz *et al.* 2024: 101). The circumstance points to similar mechanisms of ostentation and identity construction adapted to an inland Iberian context.

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