Uses of Alum in Body Care
Evidence from the Iberian Peninsula (14th-16th Centuries)

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Abstract
This work deals with the use of alum in cosmetics, perfumes, corporal adornment, and body care in the Iberian Peninsula during the Late Middle Ages. The issue is explored through the examination of several manuscripts (fifteenth and sixteenth centuries) from Spanish libraries, such as the National Library (Madrid) and the Columbine Library (Seville), which hold collections of recipes that explain the use of alum in skin care, teeth and gums, hair-dyeing and bad breath. These uses demonstrate that medieval society was aware of the bactericide, deodorant, astringent, and mordant properties of alum, as well as the importance granted to products related to body care and aesthetics.

Keywords
alum, medicine, cosmetic, perfume, aesthetics, body care
Utilisations de l’alun dans les soins du corps
Témoignages de la péninsule Ibérique (xivᵉ-xviᵉ siècle)

Résumé

Ce texte traite de l’utilisation de l’alun dans les cosmétiques, les parfums, la beauté et les soins du corps dans la péninsule ibérique à la fin du Moyen Âge. La question est explorée à travers l’examen de plusieurs manuscrits des xive et xvie siècles de bibliothèques espagnoles, telles que la Bibliothèque nationale (Madrid) et la Bibliothèque colombine (Séville), qui détiennent des collections de recettes expliquant l’utilisation de l’alun dans les soins de la peau, des dents et des gencives, pour la teinture des cheveux et contre la mauvaise haleine. Ces usages démontrent que la société médiévale était consciente des propriétés bactéricides, déodorantes, astringentes et mordantes de l’alun, ainsi que de l’importance accordée aux produits liés aux soins corporels et à la beauté.

Mots-clés

alun, médecine, cosmétique, parfum, esthétique, soin du corps

The term alum refers to a series of compounds comprising a trivalent and a monovalent bisulphate. Potassium bisulphate can be found in nature, and it was generally extracted in alum mines, in the form of alunite and other sulphates, which were toasted and leached to obtain potash alum.¹ The process involves subjecting a metal, which is brought to an oxidation state +3, to the action of a base, which brings in the monovalent metal. Typical alums were made with iron (Fe), chromium (Cr) and aluminium (Al), all of which can be easily brought to a +3 valence in reaction to caustic soda (NaOH) (monovalent metal sodium – Na⁺), potash (KOH) (potassium – K⁺), and ammonia (NH₃ – ammonium NH₄⁺). As a result of this procedure, historical alums were as a rule not

pure compounds; they also contained impurities that could affect their behaviour. Their specific properties depended on the trivalent and monovalent metals in their composition. The most common type was potash alum, and it is the uses of this type that this article describes.\textsuperscript{2}

In a second step, the excess base is corrected by using sulphuric acid (H\textsubscript{2}SO\textsubscript{4}). Most of the properties of alum are derived from the aluminium, which is more reactive than potash. The use of alum in cosmetics has changed but little since the Middle Ages. The compound has astringent and healing properties, being applied on open wounds or on spots and blackheads. It also has antiseptic and bactericide properties. The compound leaves a transparent film when applied, preventing the proliferation of bacteria; it can also be used for dental and gum hygiene and as a deodorant in armpits, feet, and other parts of the body. Finally, owing to its ionic charge and its molecular structure, alum cannot be absorbed by the skin, preventing rashes; as well as acting as a deodorant, it refreshes the skin after shaving and depilation (the film that forms over the skin forms a caustic soda-like base, which has a soapy texture, but milder, for it is partially neutralised). Alum was also used as a mordant to strengthen the colour of hair dyes and woollen fabrics (the slightly corrosive nature of the compound would open up the fibres, facilitating the penetration of the dye).\textsuperscript{3}

### Scientific manuscripts as a source of evidence

The information used for this study were found in manuscripts whose content is largely scientific in character. In the fourth century BC, Hippocrates of Cos wrote down a large number of cosmetic recipes, while Galen of Pergamon, in the second century AD, distinguished between natural cosmetics, the purpose of which was the preservation of natural

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\textsuperscript{2} The synthetic procedure for potash alum is as follows: 1\textsuperscript{st} step: 2 Al (s) + 2 KOH (ac) + 6 H\textsubscript{2}O (l) \rightarrow 2 K[Al(OH)\textsubscript{4}] (ac) + 3 H\textsubscript{2} (g). 2\textsuperscript{nd} step: K[Al(OH)\textsubscript{4}] (ac) + 2 H\textsubscript{2}SO\textsubscript{4} (ac) \rightarrow KAl(SO\textsubscript{4})\textsubscript{2} (ac) + 4 H\textsubscript{2}O (l). I want to thank Rafael Estevez, Doctor in chemistry, for revising the manuscript.

beauty, and artificial cosmetics, whose end was to present an antinatural and false form of beauty. These ideas persisted throughout the central centuries of the Middle Ages, during which several cosmetic treatises were written: the *Catholica Magistri Salerni* are a collection of instructions compiled by the Salernitan school of medicine in the first half of the twelfth century; the *De curis mulierum*, by Trotula of Salerno, a physician related to the Salernitan school, who participated in the production of various treatises, although *De curis mulierum* seems to have been the only one that he wrote single-handed; the *Régimen del cuerpo*, by Aldebrandino of Siena, written before 1257, which includes a number of cosmetic recipes taken from Avicenna’s *Canon*; and, the *Consilia*, written approximately in 1237, by the founder of the famous school of medicine of Bologna, the Florentine Taddeo Alderotti.

This feeling of continuity began breaking down in the Late Middle Ages. For instance, Henri of Mondeville, personal physician of Philip IV of France, distinguished in his work *La Chirurgia*, written in the early fourteenth century, between pathological and cosmetic aspects in the treatment of the skin. However, in the Iberian Peninsula cosmetic information continued appearing in medical treatises written in the fifteenth century, for instance Alfonso de Chirinos’s (1365-1429) *Menor daño de la medicina*, published for the first time in Toledo in 1505; de Chirinos was the personal physician of John II of Castile and *alcalde* and examinator of the kingdom’s physicians and surgeons. We may even consider the collection of medical recipes included in the Valencian Joaot Valero’s *Manual de Tintorería* (1497) as belonging to this category; the manuscript is currently held by the Biblioteca Histórica, Universidad de Valencia, and has been studied by Lluís Cifuentes i Comamala.

In any case, the information dealing with cosmetics is found in miscellaneous texts, which are a late projection of Classical encyclopaedias, such

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5. Giacosa, 1901, p. 71-162.
as Pliny the Elder’s *Natural History*, which reproduces several cosmetic recipes. Generally, these texts do not support the validity of the information conveyed on authority, but on practical experience. They refer to everyday practices (cosmetics, perfumery, gastronomy, body care), which can be assumed were passed down orally by women — the traces of a female field of knowledge, key for matters of personal hygiene, is often assumed but very hard to track. The writing down of this knowledge must express the concern, mostly of aristocratic women, for the preservation of this knowledge, and the wish to pass it down to later generations.¹²

The cosmetic recipes in Manuscript 7-6-26, Biblioteca Colombina, dated to the late fourteenth century, have been analysed by Adolfo Hamer and Teresa Criado Vega. The recipes begin with the so-called *Alphita sive synonyma herbarum*, an anonymous medical-botanical glossary comprising 2,265 entries that reflect the evolution undergone by medical and botanical technical vocabulary, with both Classical and Arabic roots, within the context of the Salernitan school of medicine in the eleventh and twelfth centuries;¹³ the work opens with the text “Comiença la Sinonima de los nombres de las medeçinas griegos e latynos e abraycos: los quales nombres pertenesçen a los libros de la física e de la çilurgía las quales se siguen por las letras del abc.a.b.c. (1351)”. The manuscript, including the glossary, is written in Spanish, and contains a large number of recipes, haphazardly organised; the *Alphita* is independent from the rest, that is, an addendum (but written on the opening pages of the manuscript), an impression confirmed by the fact that the handwriting of the recipes is different from that used in the *Alphita*. In addition to cosmetic instructions, the recipes include remedies for several pathologies and cooking recipes, all of which make use of sugar.¹⁴

Many other texts that include cosmetic recipes in the Iberian Peninsula are dated to the Early Modern Age. Manuscript 1462, Biblioteca Nacional de España, entitled *Livro de receptas de pivetes, pastillas e uvas perfumadas y conservas*, bears in the first page the name of a lady, who may have been one of its first owners (*Este lyuro he de Joana frrz*), perhaps a member of the Portuguese court related to the convent of Madre de Deus de las Clarisas

Descalzas, Lisbon, to which the emblem that also features in the first page belongs. The manuscript includes a recipe attributed to Empress Isabella, wife of Charles V, which frames the manuscript within the dates of their marriage (1526-1539). These dates agree with that of the above noted emblem. Other recipes mention the Countess of Puñoenrostro, Rincón of Valladolid and Paulo Alexandrino of Parma. The recipes were written down by approximately ten different copyists, suggesting that the book was owned by a number of people in turn, being perhaps passed from mothers to daughters. The manuscript is eminently domestic in nature, full of personal notes about the recipes (“I have not tried it”) and changes to their instructions (“I do it like this”). Recipes deal with nutrition, cosmetics, perfumes, medicine, and, especially, body care.

Manuscript 6058, Biblioteca Nacional de España, is entitled _Recetas y memorias para guisados, confituras, olores, aguas, afeites, adobos de guantes, ungüentos y medicinas para muchas enfermedades_. Most of it dates from the sixteenth century, as shown by the use of an elegant humanistic italic type of lettering, and the rest to the seventeenth century, when the lettering is less clear and harder to read. It includes 207 recipes, most of which (150) are cooking recipes; the rest deal with healthcare, cleaning and beauty. The cooking recipes vary widely: stews, meat dishes, salty and sweet pastries, biscuits and confectionery; there are also a large number of recipes for perfumed water; the closing pages of the manuscript deal mostly with cleaning recipes, including clothing care and recipes to perfume gloves. It was written by several hands, at least twelve, and the index and tables are followed by a group of miscellaneous recipes added in the seventeenth century. The female presence is explicitly noted in several mentions, including one to the mother and sister (Inés Francisca Marcos, dead in 1615) of, probably, one of the manuscript’s owners, and to other ladies, such as “doña Ana” and “doña Petronila”.

Manuscript 2019, _Receptas experimentadas para diversas cosas_, dates from the seventeenth century. It has neither cover nor index, and its 710 recipes cover a large number of topics: cooking, confectionery, cosmetics, perfumery, cleaning and medicine, divided into sixteen separate booklets, which are separated by blank pages. The possible owners include a duchess and a lady from Valencia and, although various male names are mentioned —e.g. the Duke of Calabria, Don Fernando and Juan de Herrera— the female presence is clearly predominant. The titles indicate that some of the recipes are linked to
the nobility or to convents, for instance those that describe the confectionery made at the convent of Santo Domingo el Real, Toledo. Cosmetic recipes are especially numerous, notably those that give instructions to make facial waters and hand creams, as well as hair dying and removal.\footnote{For the description of these manuscripts at the BNE see Criado Vega, 2012, p. 44-51.}

Alicia Martínez Crespo argues that these manuscripts at the Biblioteca Nacional de España (1462, 2019 and 6058) constitute a set, as they are very similar to one another and to the Manual de mujeres, currently held in the Biblioteca Palatina of Parma; some of the recipes are identical; domestic recipes are clearly predominant (cosmetics, perfumery, gastronomy, medical remedies); and some the recipes mention personal names. The Manual de mujeres is an anonymous Spanish manuscript dating from the sixteenth century; it has forty-three folios, and is organised into seven sections: medicine, beauty, mouthwashes, perfumes, etc. It is written in round Gothic script by a single copyist, but also presents notes made by different hands, drawings and the names of some of its owners. Like the manuscripts at the Biblioteca Nacional de España, the topics covered include medicine, cosmetics, hygiene and cooking. The 145 recipes are randomly arranged, but an index indicates the page in which they can be found.\footnote{Martínez Crespo, 1995; Criado Vega, 2012, p. 76-77.}

Finally, the also Spanish Regalo de la vida humana is a codex in the Österreichische Nationalbibliothek, Vienna, written by the Navarre Juan Vallés (1496-1563), treasurer of the Navarre queen during the first half of the sixteenth century. Until recently, its contents were virtually unknown, because only one copy exists (Codex Vindobonensis Palatinus, Ms. 11160). The manuscript is eminently practical in nature and is divided into seven parts, dealing with the hygiene and care of the hair, face and hands; perfumes, perfumed waters and powders; perfumed or medicinal oils, also used in surgery; sugar and honey preserves; confectionery made with fruits; other cooking recipes; and, wines, liquors, vinegars and other drinks. It was edited by Fernando Serrano, and analysed in detail by several specialists in 2008.\footnote{Serrano Larráyoz, 2008, p. 261-756; Cabré I Pairet, 2011, p. 178-182; Criado Vega, 2012, p. 75-76.}

These collections of cosmetic and perfumery recipes lead, in the mid-sixteenth century, to Gioanventura Rosetti’s Notandissimi secreti de l’arte profumatoria, published for the first time in Venice by Francesco
Rampazetto in 1555. Although it was written in Italy, a territory where a large number of single-topic technical treatises (dyeing, metallurgy, trade) were produced from the fourteenth century onwards, its study is essential for the production of cosmetic and perfumery recipes elsewhere during this period. It includes instructions to make soap, hand and face cosmetic products, toothpaste and hair dyes. It was splendidly studied by Franco Brunello and Franca Facchetti in 1973.\(^{18}\)

### Applications of alum in cosmetics and perfumes

The information provided by these texts and collections of recipes dated between the fourteenth and sixteenth centuries yield valuable evidence for the role played by alum in body care, beauty—it was largely used for hair dyes and to cover white hair—and healthcare, especially dental care—it was used in toothpastes and formulas to keep the teeth firm. Let us have a look at some of these applications.

### Hair dyeing and covering white hairs

Alum-based recipes for hair dyeing and covering white hairs are attested in the West from the twelth century, and become very abundant in the fifteenth and sixteenth centuries. The *Catholica Salerni*, a compilation of instructions by doctors at the medical school in Salerno, dating from the first half of the twelth century, includes two recipes to dye hair *flavi* and *aurei* and one (which also uses gall nuts) to dye hair dark, all of which use alum as mordant, prior to the application of the dye.\(^{19}\) In the twelth century, Aldebrandin of Siena reproduces two more recipes from Avicenna’s *Canon* and a few miscellaneous notes to dye hair blond or black and eliminate superfluous body hair by using arsenic- and alum-based compounds.\(^{20}\)

Gioanventura Rosetti’s *Profumatorìa* also includes several recipes to dye hair blonde or black and to cover white hair. These recipes are based on a number of mineral and vegetal compounds, as well as on the use of alum.

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as mordant.\textsuperscript{21} Aurora Benaiges argues that the Renaissance witnessed the proliferation of recipes to dye hair with natural soda (\textit{salnitro}) followed by sun exposure; the substances used were the result of mixing macerated plants, roots, tree barks, flowers and ashes with vegetal extracts and mucilage, alum being used as mordant, to strengthen the colour and make the dye more resistant to washing and combing.\textsuperscript{22}

In the Iberian Peninsula, this use of alum is documented in several manuscripts dated from the fourteenth to the sixteenth century. The body care recipes in the Biblioteca Colombina, which have been studied by Adolfo Hamer and Teresa Criado Vega, include one entitled “For blonde”, which conveys the following instructions: “Take walnut oil before it flowers, from the largest root; take a slice and chop it, boiling the seep that comes out of it in a sauce pan; apply this to the hair, after washing and treating with alum.”\textsuperscript{23} The base of the compound are walnut tree roots, which are rich in tannin and are still used today to cover white hairs;\textsuperscript{24} the alum plays a key role as mordant, as the recipe insists that the dye is only to be applied on hair that has been previously washed with alum water.

The recipe in Manuscript 6058, Biblioteca Nacional de España, “Alum powder recipe to dye hair blonde”, is similar. The recipe prescribes applying the dye on hair that has been previously bleached or treated with water that has been used to solve alum. Other hair-dyeing recipes in this manuscript use shoot and ash tree ash, bleach, sulphur, plants, flowers, egg yolk, galls and alum. The dye ingredients were mixed in a flask, and were only to be applied after the hair had been bleached or treated with water used to solve alum.\textsuperscript{25}

The recipe in Manuscript 7-6-26 in the Biblioteca Colombina, “To dye hair black”, currently held in Seville cathedral, recommends the use of “Acije [copperas], galls, sumach and pepper; boil until it has reduced by two thirds, and apply after washing the hair with alum, and then wash


\textsuperscript{22}Benaiges, 2017, p. 69.

\textsuperscript{23}BC, Ms. 7-6-26, “Para rubio”, fol. 2v (Hamer, Criado Vega, 2016, p. 249).

\textsuperscript{24}http://i-natura.blogspot.com/2013/03/el-nogal-y-remedios-medicinales-caida.html (accessed on 10/07/2020)

\textsuperscript{25}BNE, Ms. 6058, “Receta para los polvos de alume para enrubiar los cabellos y para el dolor de cabeza”, fol. 27 (Criado Vega, 2012, p. 240).
again”. In this case, the raw materials are similar to those used for writing ink (copperas, galls and sumach), and alum plays the same role as in the previous recipes, as mordant.26

Alum was also used to fight alopecia, to prevent hair falling or to make it grow again. Rosetti’s Profumatoria includes several recipes to remove body hair, using the distillation of a mixture of alum with saltpetre or potassium nitrate.27

Compounds for cleaning teeth and prevent bad breath

Another major use of alum in body care was as a component of toothpastes and products to prevent bad breath. In fact, alum is still used for this purpose, owing to its strong bactericide properties. One of the main causes of bad breath is the accumulation of bacteria, toxins and acids in the digestive system, especially in the mouth. Alum-based mouth washes can eliminate the formation of these bacteria and inhibit the formation of new ones. Hippocrates’s mouthwash, made with vinegar, salt and alum powder, was very similar to that which Listerine put on the market in the late nineteenth century. Alum can be solved in water, tea and other liquids to make a mouthwash, or can be directly rubbed on the gums, and even taken as a pill.28

Alum has been abundantly used for dental hygiene since the classical period. We have already mentioned a mouthwash prescribed by Hippocrates to prevent bad breath, while Pliny mentions a recipe for teeth whitening based on potassium nitrate. These recipes are abundantly found in medieval technical manuscripts, for instance in Trota of Salerno’s De curis mulierum, the Catholica Magistri Salerni and

26. BC, Ms. 7-6-26, “Para los cabellos negros”, fol. 2v (Hamer, Criado Vega, 2016, p. 251).
27. The term saltpetre was used to refer to potassium nitrate (KNO₃) or sodium nitrate (NaNO₃) (Brunello, Fachetti, 1973, p. 220).
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Aldebrandin of Siena’s *Régime du Corps*, which includes a recipe against bad breath using galls, mineral salt, ash, salicornias, nitrate and alum. Texts related to mouth hygiene are included in several sixteenth-century Castilian manuscripts. The *Manual de Mujeres*, currently held at Biblioteca Palatina, Parma (Italy), analysed several years ago by Alicia Martínez Crespo, conveys a recipe to make pills against bad breath that make use of alum.

> Take half an ounce of frankincense, half of seedling, half of dragon’s blood, half of walnut tree root, half of sage, half of mata, half of burnt alum, half of rock comfrey, half of white coral, half of red coral, a quarter ounce of cagibia, another quarter of galigal, another of cinnamon, another of cloves, half an ounce of burnt date bones, half an ounce of mosqueta rose, half of pumice stone, and have an ounce of cochineal powder. Knead all this well with musky alquitira. Leave the tablet to dry in the sun or in the shade.

It is likely that these tablets were chewed or let to dissolve in the mouth. Juana Fernández’s recipe book, which dates from the second half of the sixteenth century (Ms. 1462, Biblioteca Nacional de España), contains a recipe entitled “Recipe to make powder for the teeth”, also against bad breath and to clean the teeth, although in this case the final product is in the form of powder, instead of tablets. “Burn rosemary sprigs, mix with white wine, burnt eggshell and burnt alum; after grinding and sieving, apply to the teeth with a cloth doused in oil. Rinse with white wine.” Like in the previous recipe, alum was included in the recipe owing to its bactericide properties.

Finally, in the chapter dedicated to mouth hygiene, Juan Vallés’s *Regalo de la vida humana* includes two recipes to whiten teeth based on alum, dragon’s blood and mastic.

30. BPP, Ms. 834, fol. 4v-5r (Martínez Crespo, 1995, p. 70; Criado Vega, 2012, p. 236).
31. BNE, Ms. 1462, recipe 6, s. /fol. (Criado Vega, 2012, p. 236).
Compounds to redden gums and fix teeth

Other recipes were more directly related to healthcare than with aesthetics or with the social projection of the body. Alum was used, and is still used today, for its astringent properties, to protect the tissue that covers the gums against infection and illness. Aldebrandin of Siena’s Physic Book, written before 1257, recommends rubbing or washing the gums and teeth, but gently, because excessive rubbing could damage the gums and loosen the teeth. Identical recommendations are found in Taddeo Alderotti’s Consilia (written after 1295) and Guy de Chauliac’s Chirurgie, written in the fourteenth century. For his part, Alonso de Chirinos’s Medicine Book offers a remedy for loose teeth, based on a mix of dragontea, mastic and alum.

In the same vein, the use of alum as a bactericide features in compounds that aimed to harden the gums, fixing the teeth more firmly. The Manual de Mujeres contains a recipe, “To flesh out teeth” which recommends:

“Take two ounces of burnt alum, two of dragon’s blood, a quarter of cinnamon and an eight of mastic. Grind everything, sieve, and mix with ten ounces of raw honey in a clay pot. Heat until it boils and thickens. Take a little strip of cloth, and apply the mix on it. Apply to the gums and leave it overnight; rinse water with warm wine or water.”

Almost identical raw materials are prescribed the medical recipes included in Joanot Valero’s Manual de Tintorería. For instance, the recipe “Powder to fix the teeth”: “Take one dinero of rock alum, one dinero of frankincense, a bit of mastic, a dinero of cinnamon and a dinero of pepper; grind and mix together. After mixing, and rub your teeth in the morning and night, and they will be firm.”

Finally, Manuscript 2019, Biblioteca Nacional de España, includes a recipe entitled “Recipe to make powder for the teeth”, which prescribes:

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34. Moulinier-Brogi, 2013, p. 222.
Two ounces of nutmeg, cinnamon, cloves, tostas, ginger and orange peel, one ounce of burnt alum, orange blossom oil and jasmine. Soak the Valencian almonds in orange blossom water for an hour and dry with a cloth afterwards; take orange blossoms and jasmine, taking the orange bit from inside the orange blossoms. Cover the almonds with a bed of flowers. Leave for six or eight days, changing the flowers two or three times a day. Grind the almonds, extracting their oil. Put the oil in a bowl and leave in the sun, and overnight, for eighteen or twenty days. Sieve through a clean cloth and put in a cup. Leave it for a year. The longer it sits, the finer it will be.\textsuperscript{38}

Although the recipe does not specify how this is to be applied, since the mix is in the shape of a powder, it is to be assumed that they were for rubbing on the teeth, either with a cloth or the hands.

\section*{Conclusion}

Numerous Spanish texts dating from the fourteenth to the sixteenth centuries convey technical body care recipes in which alum played a part. Especially important are some medicine texts, such as Alfonso de Chirinos’s or Joanot Valero’s, but most of them are miscellaneous texts transmitted among women, such as Manuscript 7-6-26, Biblioteca Colombina (Seville), and Manuscripts 1462, 2019 and 6058, Biblioteca Nacional de España (Madrid), the \textit{Manual de mujeres}, Biblioteca Palatina (Parma) and Juan Vallés’s \textit{Regalo de la vida humana}. Alum was used owing to its valuable properties, especially in relation to the care of skin and teeth, hair dyeing, the suppression of halitosis, and the preservation of teeth and gums.

These uses demonstrate that medieval society had considerable empirical knowledge of alum’s properties, both with regard to health and body care (particularly owing to alum’s bactericide, deodorant and astringent properties, especially indicated to treat bad breath and strengthen the gums) and to its qualities as mordant (both to rinse hair dyes and to prepare the hair before dyeing, making the colours more resistant to washing and the pass of time).

The use of alum in cosmetics, perfumes and other healthcare and beauty products is among the less known applications of this substance in the Late

\textsuperscript{38} BNE, Ms. 2019, “Hacer polvos para los dientes”, fol. 62r.
Middle Ages, although it was among the most common. These applications, along with better known ones, such as its use as mordant for dyeing cloth and tanning fur, as well as its value as a stain remover, explains the enormous commercial activity that revolved around alum between the fourteenth and sixteenth centuries, which are also the centuries in which the manuscripts examined in this article were written.39

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