**Supplementary Material**

**Pattern identification in data about unmodified waste eggshell application as an adsorbent for metal ion removal from aqueous media**

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**Table S1:** Eggshell pre-treatment procedures and eggshell source.

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| **Eggshell source** | **Eggshell preparation procedure** | **Drying parameters** | **Source** |
| **T (oC)** | **Time (h)** |
| *Local restaurants* | *washed with purified water → dried → pulverized* | 100 | 2 | (Dayanidhi et al. 2020) |
| *X* | *washed with purified water → dried → pulverized* | 80 | X | (Pettinato et al. 2015) |
| *X* | *washed with purified water → dried → pulverized* | 25 | 24 | (Çelebi et al. 2021) |
| *Kitchen waste* | *washed with purified water → dried → pulverized* | 40 | 10 | (Abbas et al. 2021) |
| *Local restaurants* | *washed with purified water → dried → pulverized* | 50 | 120 | (Ahmad et al. 2012) |
| *Local bakery* | *washed with purified water → dried → pulverized* | 150 | 3 | (Mashangwa et al. 2017) |
| *X* | *washed with purified water → dried → pulverized* | 50 | 0.58 | (Khaskheli et al. 2021) |
| *Local restaurants* | *washed with purified water → dried → pulverized* | 110 | 24 | (Mohammad et al. 2022) |
| *Local bakery* | *washed with purified water → dried → pulverized* | 60 | 24 | (Polat and Aslan 2014) |
| *Kitchen waste* | *washed with purified water → dried → pulverized* | 70 | 12 | (Annane et al. 2021) |
| *Kitchen waste* | *washed with purified water → dried → pulverized* | 40 | overnight | (Tizo et al. 2018) |
| *Local grocery* | *washed with purified water → dried → pulverized* | 80 | X | (Chojnacka 2005) |
| *Local restaurants* | *washed with purified water → dried → pulverized* | r.t. | several days | (Elabbas et al. 2016) |
| *Local restaurants* | *washed with purified water → dried → pulverized* | 105 | 24 | (Harripersadth et al. 2020) |
| *X* | *washed with purified water → dried → pulverized* | 90 | 2 | (Zonato et al. 2022) |
| *X* | *washed with water → dried → pulverized* | 60 | 1 | (Zadeh et al. 2018) |
| *Local market* | *washed with tap water → dried → pulverized* | 100 | 24 | (Jeremias et al. 2020) |
| *Local grocery* | *washed with tap water → pulverized → dried* | 80 | overnight | (Kim et al. 2019) |
| *Campus breakfast store* | *physical cleaning → dried → pulverized* | 55 | X | (Ho et al. 2014) |
| *Local food market* | *washed with water → pulverized → washed with water → dried → pulverized* | 105 | overnight | (Alomari 2020) |
| *X* | *washed with purified water → pulverized → dried → pulverized* | 105 | X | (Makuchowska-Fryc 2019) |
| *Local grocery* | *washed with purified water → dried → pulverized → washed with purified water → dried* | 1 – 502 – 50 | 24 | (Hess et al. 2018) |
| *Local restaurant* | *washed with purified water → dried → pulverized → washed with purified water → dried → pulverized* | 1 – r.t.2 – 60 | 1 - several days 2 - 24 | (Sabah et al. 2018) |
| *Local restaurant* | *washed with purified water → dried → pulverized → washed with purified water → dried → pulverized* | 1 – 1002 – 100 | 1 – 24 2 - 24 | (Hamouda et al. 2020) |
| *Local canteen* | *boiled in 0.03 HCl (10 min) → soak in distilled water for 1 hour → dried → pulverized (ball mill)* | r.t. | X | (Baláž et al. 2016) |
| *X* | *physical cleaning → washed with hexane → washed with purified water → dried → pulverized* | 70 | 24 | (Metwally et al. 2017) |
| *Local bakeries, restaurants and households* | *washed with purified water → dried → pulverized → treated in 1.3% sodium hypochloride solution (1 h) → dried → pulverized*  | 1 - r.t.2 - 50 | 1 - 24 2 - 24 | (Alamillo-López et al. 2020) |
| *Local cafeteria* | *washed with purified water → boiled in water (10 min) → dried → pulverized* | 150 | 3 | (Abatan et al. 2020) |
| *X* | *pulverized (ball mill)* | X | X | (Özcan et al. 2018) |
| *Industry of pasteurized liquid eggs and boiled eggs* | *frozen at -12 °C → defrosted → pulverized* | r.t. | 24 | (Soares et al. 2016) |

X, parameter not mentioned in the publication; r.t., room temperature.