Petroleum engineering-themed crossword puzzle #13

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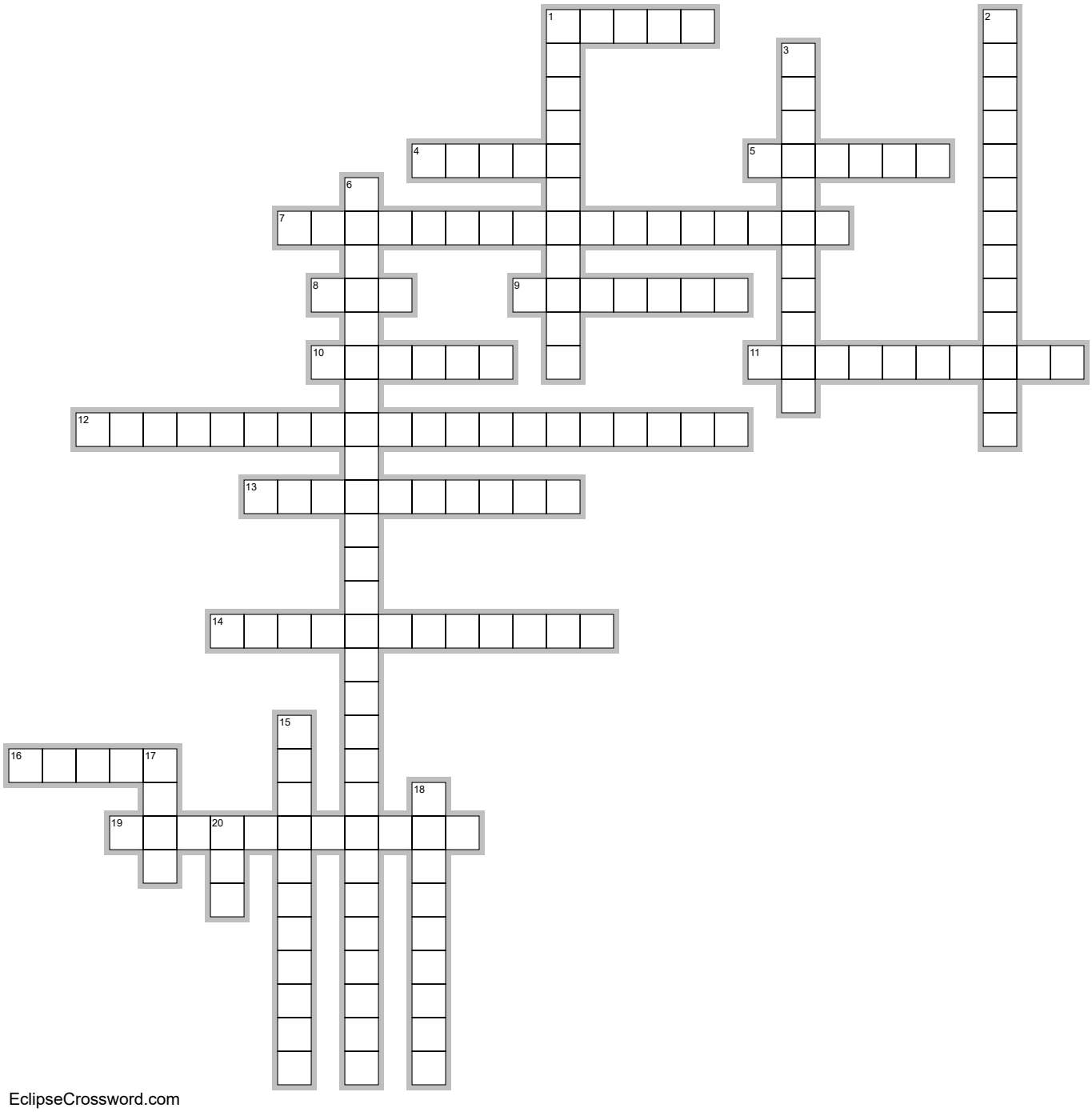

EclipseCrossword.com

Across

1. Change that precipitated asphaltenes undergo over time, becoming harder or more compact
4. A distinct state of matter in a system
5. Method relying on human observation of cloudiness or particle formation to detect asphaltenes is called a _____ method
7. A thermal analysis method where a sample's weight is measured as it is heated
8. Surface analysis technique that can detect elements like S, N on asphaltene surfaces (abbr.)
9. Ultraviolet-_____ spectroscopy can be used to study asphaltene absorption and aggregation in solution
10. Increase in size of asphaltene particles once precipitation has begun

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Across

11. Initial step in phase separation where small stable clusters (nuclei) form
12. Instrument known as the _____ used to detect onset in live oil under reservoir conditions (3 words)
13. Method of separating precipitated asphaltenes by passing the mixture through a filter (often to determine amount precipitated)
14. Process by which suspended particles clump together, synonymous with aggregation
16. X-ray absorption method used to study the chemical state of heteroatoms in asphaltenes (abbr.)
19. Determination of asphaltene content by adding n-alkane and weighing precipitated solids is a _____ method

Down

1. Clumping together of asphaltene molecules into larger particles after they precipitate
2. Process of separating crude oil into portions based on differences (e.g., boiling point or polarity)
3. State when opposing processes balance each other
6. Chromatography method used to determine molecular weight distribution (3 words)
15. Property referring to the percentage of carbon atoms in aromatic rings; can be derived from ^{13}C NMR
17. A common compositional breakdown of crude oil is given by the _____ fractions
18. Spread of asphaltene molecules from high-concentration regions to low
20. Technique that measures average molecular weight by assessing osmotic pressure (abbr.)