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Path #9. In this path we will see 52 questions to be studied for the API 653 Certification Examination. The following questions correspond to SOIL CORROSION and CAUSTIC CORROSION

The following questions were extracted from the standards by me. The format is a Q&A one, different from the multiple choice question format from other courses I have seen online. I prefer this method because it takes away all the clutter that leads to confusion when treating these standards. I advise you to copy this info and paste it in a spaced repetition software like Anki or Supermemo, as the Q&A format allows, and start studying right away. Please edit the questions yourself looking to the references if you have difficulty remembering any of them.

The following questions correspond to SOIL CORROSION

332. Q: What is the name of the damage mechanism present when there is deterioration of metals exposed to soils?
A: Soil corrosion Ref: API 571 4.3.9
333. Q: API 571 lists 3 affected materials that suffer soil corrosion. Besides carbon steel and cast iron, it also affects _____
A: Ductile iron Ref: API 571 4.3.9
334. Q: API 571 lists 3 affected materials that suffer soil corrosion. Besides carbon steel and ductile iron, it also affects _____
A: Cast iron Ref: API 571 4.3.9
335. Q: API 571 lists 3 affected materials that suffer soil corrosion. Besides carbon steel and cast iron, it also affects _____
A: Carbon steel Ref: API 571 4.3.9
336. Q: Which parameter is frequently used to estimate soil corrosivity?
A: Soil resistivity Ref: API 571 4.3.9

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337. Q: When there is soil corrosion, is there a correlation between corrosion rate and temperature?
A: Yes, there is more corrosion the higher the temperature Ref: API 571 4.3.9
338. Q: Name the damage mechanism that affects underground piping and equipment as well as buried tanks, the bottoms of above ground storage tanks, and ground supported metal structures.
A: Soil corrosion Ref: API 571 4.3.9
339. Q: Where is soil corrosion more likely?
A: At the soil-to-air interface Ref: API 571 4.3.9
340. Q: What is the appearance of soil corrosion?
A: external thinning with localized losses due to pitting Ref: API 571 4.3.9
341. Q: Soil corrosion of carbon steel can be minimized through the use of _____, coatings and cathodic protection.
A: Special backfill Ref: API 571 4.3.9
342. Q: Soil corrosion of carbon steel can be minimized through the use of special backfill, _____ and cathodic protection.
A: Coatings Ref: API 571 4.3.9
343. Q: Soil corrosion of carbon steel can be minimized through the use of special backfill, coatings and _____
A: Cathodic Protection Ref: API 571 4.3.9
344. Q: The most effective protection against soil corrosion is _____
A: a combination of a corrosion resistant coating and a cathodic protection system. Ref: API 571 4.3.9

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345. Q: The most common method used for monitoring underground structures against soil corrosion is _____
A: measuring the structure to soil potential using dedicated reference electrodes near the structure Ref: API 571 4.3.9
345. Q: Cathodic protection to reduce soil corrosion should be performed and monitored in accordance with which RP?
A: NACE RP 0169 Ref: API 571 4.3.9
347. Q: To estimate the probability of soil corrosion, several characteristics must be combined to estimate the corrosion in particular soil as outlined in _____ as well as API RP 580 and Publ 581.
A: ASTM STP 741 Ref: API 571 4.3.9
348. Q: To estimate the probability of soil corrosion, several characteristics must be combined to estimate the corrosion in particular soil as outlined in ASTM STP 741 as well as _____ and Publ 581.
A: API RP 580 Ref: API 571 4.3.9
349. Q: To estimate the probability of soil corrosion, several characteristics must be combined to estimate the corrosion in particular soil as outlined in ASTM STP 741 as well as API RP 580 and _____.
A: Publ 581 Ref: API 571 4.3.9
350. Q: Poor condition of a protective coating in a buried or ground supported structure is a telltale sign of potential _____ damage
A: Soil corrosion Ref: API 571 4.3.9

The following questions correspond to CAUSTIC CORROSION

351. Q: Caustic corrosion usually occurs under _____ or high heat transfer conditions.
A: Evaporative Ref: API 571 4.3.10

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352. Q: Caustic corrosion usually occurs under evaporative or _____ conditions.
A: high heat transfer Ref: API 571 4.3.10
353. Q: Caustic corrosion mostly creates localized corrosion, but can cause general corrosion depending on _____
A: Caustic solution strength. Ref: API 571 4.3.10
354. Q: Caustic corrosion affects primarily _____, low alloy steels and 300 Series SS.
A: Carbon steels Ref: API 571 4.3.10
355. Q: Caustic corrosion affects primarily carbon steel, _____ and 300 Series SS.
A: Low alloy steels Ref: API 571 4.3.10
356. Q: Caustic corrosion affects primarily carbon steel, low alloy steels and _____.
A: 300 series SS Ref: API 571 4.3.10
357. Q: Which damage mechanisms are mostly associated with the presence of NaOH?
A: Caustic corrosion and Caustic Stress Corrosion Cracking Ref: API 571 4.3.10
358. Q: Which damage mechanisms are mostly associated with the presence of KOH?
A: Caustic corrosion and Caustic Stress Corrosion Cracking Ref: API 571 4.3.10
359. Q: Caustic corrosion is most often associated with _____ and steam generating equipment including heat exchangers.
A: boilers Ref: API 571 4.3.10
360. Q: Caustic corrosion is most often associated with boilers and steam generating equipment including _____
A: Heat exchangers Ref: API 571 4.3.10

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361. Q: The concentrating effects of caustic may occur _____
A: where caustic is added to crude unit charge Ref: API 571 4.3.10
362. Q: Preheat exchangers, furnace tubes and transfer lines can suffer _____ related to caustic corrosion
A: Accelerated localized corrosion Ref: API 571 4.3.10
363. Q: How can you avoid caustic accelerated localized corrosion in preheat exchangers, furnace tubes and transfer lines
A: Achieving effective mixture in the oil stream Ref: API 571 4.3.10
364. Q: To remove sulfur compounds from product streams you can use _____
A: Caustic products Ref: API 571 4.3.10
365. Q: Caustic corrosion in a boiler tube appears as _____
A: Localized metal loss that may appear as grooves Ref: API 571 4.3.10
366. Q: Caustic corrosion is typically characterized by localized metal loss which may appear as grooves in a boiler tube or _____
A: Locally thinned areas under insulating deposits Ref: API 571 4.3.10
367. Q: You would use a sharp instrument to probe suspect areas of _____, because it generates deposits that may fill corroded depressions
A: Caustic corrosion Ref: API 571 4.3.10
368. Q: In a vertical tube, caustic corrosion can appear as _____
A: A circumferential groove Ref: API 571 4.3.10
369. Q: Along a waterline, caustic corrosion causes _____
A: Localized gouging Ref: API 571 4.3.10
370. Q: In horizontal tubes, caustic corrosion can appear as _____
A: grooves in opposite sides of the tube Ref: API 571 4.3.10

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371. Q: In carbon steel, exposure to high solution strength caustic causes general corrosion, in temperatures between
A: 175°F and 200°F Ref: API 571 4.3.10
372. Q: In carbon steel, exposure to high solution strength caustic causes very high general corrosion rates, in temperatures above
A: 200°F Ref: API 571 4.3.10
373. Q: Which of the following best reduces caustic corrosion
A: Reducing the amount of free caustic inside the equipment Ref: API 571 4.3.10
374. Q: In process equipment, caustic injection facilities should be designed to allow
A: Proper mixing of caustic Ref: API 571 4.3.10
375. Q: Injection points should be inspected in accordance with _____
A: API 570 Ref: API 571 4.3.10
376. Q: For the detection of caustic corrosion, _____ equipment may require visual inspection with the use of a boroscope
A: Steam generation Ref: API 571 4.3.10
377. Q: Which of the following is a good measure for reducing caustic corrosion in steam generating equipment
A: Minimizing the ingress of alkaline producing salts into condensers. Ref: API 571 4.3.10
378. Q: Carbon steel and 300 Series SS have serious corrosion problems in high strength caustic solutions above about
A: 150°F Ref: API 571 4.3.10
379. Q: Alloy 400 and some other _____ base alloys exhibit little caustic corrosion
A: Nickel Ref: API 571 4.3.10

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380. Q: _____ and some other nickel base alloys exhibit little caustic corrosion
A: Alloy 400 Ref: API 571 4.3.10
381. Q: In steam generating equipment, caustic corrosion is best prevented
A: Through proper design Ref: API 571 4.3.10
382. Q: In steam generating equipment, which of the following actions can better prevent caustic corrosion?
A: Minimize hot spots on heater tubes Ref: API 571 4.3.10
383. Q: In process equipment, caustic injection facilities should be designed to
A: avoid the concentration of caustic on hot metal surfaces Ref: API 571 4.3.10

This pdf is part of a series of articles on API 653 questions. For more questions, see the following

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