Table 5 – Comparison of the fractional composition of the catalyst before and after fractionation

Boiling. range	GOST 51105 –97	Temperature of reaction							
		395		425		445		465	
		Catalyst	Petrol	Catalyst	Petrol	Catalyst	Petrol	Catalyst	Petrol
T_{sb},°C	≤30	36	26,2	37	27,7	37	26,8	38	23,3
10%	≤70	64	27,8	65	33,6	76	30,5	68	25,3
50%	≤120	112	129,0	116	115,4	119	115,8	109	120,4
90%	≤180	187	144,3	171	140,6	167	139,7	145	136,0
T_{eb},°C	≤205	261	155,7	261	152,7	271	152,1	242	145,1

The following conclusions may be made:

1. When the temperature increases, the output of commercial gasoline grows, the yield of the heavy residue and gases falling;
2. Significant changes of the process will produce a commercial gasoline, regulated by the state standard;
3. As for fractional composition that meets the requirements [1] it is not sufficient to change only one parameter, and we need to research all the factors that complicate the task.

References:

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TREATMENT AND DISPOSAL METHODS.

The bulk of waste falls into the category of general waste, much of which can be recycled or reused. With correct segregation, less than 5 per cent of the waste is likely to be classified as clinical waste.

Clinical waste must be managed by approved treatment methods. Once treated by a process acceptable to the relevant State or Territory authorities, it may be reclassified accordingly before recycling or disposal.

The waste treatment options currently available have various capabilities and limitations. As technology changes, health care establishments should evaluate treatment alternatives for their safety, effectiveness, environmental impact, costs, and compliance with relevant State or Territory licensing requirements. Large volumes of liquids (such as 24-hour urine collections) should generally be disposed of into an appropriate sluice. Precautions must be taken to avoid the hazards of splashing. Empty disposable containers may be disposed of as general waste, whereas non-disposable containers must be rendered safe for the intended reuse. Body fluids, particularly blood and fluids visibly contaminated with blood, should be treated with caution. Bulk blood and suctioned fluids may be disposed of into the sewer, but care should be taken to avoid splashing, which may cause health risks. A suitably experienced and trained person should carry out this procedure. The disposal of large volumes of blood into the sewer is subject to approval from the local sewerage authority.

There are special circumstances when a known infected material requires extra precautions, such as specific handling procedures required before waste removal from a microbiological laboratory. Moreover, community expectations for responsible clinical waste management require treatment of the waste before landfill disposal. Pathogenic microbiological cultures transmissible by the aerosol route should be rendered sterile by an approved treatment method before they leave the control of laboratory personnel. For special precautions regarding disposal pathways of waste from cases of viral haemorrhagic fever and other quarantinable diseases, eg Ebola or Lassa fever, refer to the relevant State or Territory legislation. In addition, AS/NZS 2243 – Safety in Laboratories details risk groupings of micro-organisms by type and Section 5 provides advice on degrees of hazard associated with various micro-organisms.

Any treatment option for clinical and related wastes should:

- render sharps incapable of causing penetration injury;
- render the waste unrecognisable;
- achieve a significant volume reduction;
- result in residues being suitable for approved landfill disposal without harmful leaching to the environment;
- result in minimum levels of hazardous or toxic by-products, including organochlorines, as approved by the relevant authority;
- reduce the potential for the transmission of infection;
- be verifiable for the treated wastes;
- have automatic controls and built-in fail-safe mechanisms;
- have continuous automatic monitoring and recording;
- ensure that the waste cannot bypass the treatment process;
- meet occupational health and safety standards;
- have fail-safe alternative treatment and disposal in case of emergency;
- provide pre-treatment refrigerated storage facilities as licensed; and, where feasible, implement materials and energy recovery strategies; and.
- in the case of autoclaves, be tested at least annually to ensure that optimal performance is maintained.

Waste treatment and disposal methods currently approved in Australia include:

- autoclaving;
- chemical disinfection.
  - grinding/shredding (sodium hypochlorite).
  - grinding/shredding (hydrogen peroxide and lime);
- landfill;
- microwave;
- regulated incineration;
- encapsulation; and.
- sewerage (as determined by relevant authorities).

Details on some of the treatment options follow.

Autoclaving.

Autoclaving involves the heating of infectious waste by steam under pressure. The effectiveness of autoclaving depends on the temperature, pressure, exposure time and the ability of steam to penetrate the container. Confirmation that the required temperature has been reached is imperative.

Noise emissions can be of concern with an autoclave and should be considered in design and siting of the equipment. The energy costs for steam production could be high. Trained staff are required to ensure proper operation. Autoclaving can produce offensive odours, which require proper ventilation to satisfy the relevant State or Territory air emission standards. Autoclaving does not change the physical form of visually offensive waste.

Condensate and blow-down liquids may contain sufficient contaminants for the effluent to be classified as hazardous. Excessive liquid contained by autoclaved waste can make the surrounding working area constantly wet. This seepage problem persists all the way to the final site of disposal. Autoclaving can be used for the bulk of clinical and related wastes. Care must be taken to exclude body parts, pharmaceuticals, including cytotoxics, and radioactive wastes. Autoclaved waste can be disposed of by landfill, provided that approval has been obtained from the relevant State or Territory authorities.

Incineration.

Incineration is a term used commonly to describe all systems of burning, although only one standard is considered to be effective. In these national guidelines ‘incineration’ is used to describe the process of combustion carried out in a multiple-chambered incinerator that has mechanisms for closely monitoring and controlling the combustion parameters.

Combustible waste can be incinerated provided that an appropriate incinerator is used. Incinerator residues can generally be disposed of in landfills. However, if the residues contain considerable heavy metal contaminants, the relevant State or Territory disposal codes of practice or legislation must be followed. Where incineration is used, the following issues should be addressed. Emission standards: Depending on the types of waste incinerated, gaseous emissions may involve toxic gases such as hydrogen chloride, nitrogen oxides, sulphur oxides, dioxins and furans. Regular maintenance of any incinerator is therefore essential to efficient operation. This will ensure that the appropriate emission requirements are met as well as minimise the long-term total running costs. Ash disposal: A well-designed and -operated incinerator will destroy any infectious and toxic waste by exposing it to a sufficiently high temperature for a sufficient time, with sufficient oxygen to burn organic matter, leaving a biologically inert ash with no combustible residue. There should be no recognisable plastic, paper or fabric in the ash. Care should be exercised in the removal and disposal of incinerator ash:.

• it should be wetted for a sufficient time before handling to minimise the potential for generating airborne dust and any fire risk;.

• the amount of water used in wetting the ash must be controlled, because excessive water in the ash may enhance leachate generation in landfill;

• all personnel handling the ash should wear face masks fitted with dust filters, heavy gloves and protective clothing as a safety precaution;

• the removal of incinerator ash should be mechanised, and be designed to facilitate continuous or semi-continuous operation of the incinerator; and.

• the ash should be stored in enclosed containers and transported to anapproved landfill site for supervised burial.

Flyash collected from particulate control devices may have high concentrations of heavy metals. It may need special disposal treatment.

The fire box, or domestic incinerator, is a single chamber in which combustion is usually incomplete and involves uncontrolled temperatures. It is therefore unsuitable for the incineration of clinical and related wastes and its use is no longer permitted.

Approved incineration is suitable for all types of clinical and related wastes, excluding radioactive wastes.

Landfill.

Landfill is a traditional disposal method for waste. Some landfill sites used in the past are unsatisfactory for disposal of clinical or other wastes because leaching can contaminate ground water or public access is not controlled. If clinical and related wastes have been carefully segregated, most of the material can be safely landfilled.

Clinical and related wastes constitute a very small proportion of the total waste stream directed to landfill (less than 1 per cent) and, when managed correctly, are no more dangerous in the landfill environment than domestic waste.

Where clinical and related wastes are disposed of by landfill, the site must be confirmed as suitable. A physically contained (engineered) site is preferable where movement of leachate is controlled.

Public access to the point of disposal of clinical and related wastes should be restricted during the active disposal period. The owner of the waste or their agent, who is trained to deal with the waste, must deposit the material at the lower edge of the working face of the landfill or in an excavation, and supervise immediate covering of the waste to a depth of one metre. (This does not apply to the general waste component of the waste stream). Soil or other solid waste may be used as cover. The recommended depth of one metre aims to prevent scavenging and accidental recovery of the waste.

The landfill site operator should sign appropriate documentation completed by the transporter. The transporter should hold proof of proper disposal.

Where landfill disposal of clinical and related wastes is intended, recognizable anatomical parts, pharmaceuticals and cytotoxic waste should be excluded at source. Landfilling of liquid wastes is not permitted. Consult State or Territory regulations for approved landfill disposal of clinical and related waste residues.

Sewerage.

Disposal of certain liquid wastes to sewer may be acceptable because the associated potential hazards are reduced through dilutions and dispersals within the sewerage system. Disposal to sewer must meet occupational health and safety guidelines. Bulk blood and suctioned fluids may be disposed of into the sewer, but care should be taken to avoid splashing, which may pose health risks. A suitably experienced and trained person should carry out this procedure. The disposal of large volumes of blood into the sewer is subject to approval from the local sewerage authority.

Approval should be obtained from the relevant authorities before any discharge of large amounts of fluid waste into the sewerage system. Sewerage is not a suitable disposal method for solid clinical and related wastes, pharmaceuticals including cytotoxics, or radioactive wastes.

Microwave.

The microwave process usually involves the grinding and shredding of waste materials to optimise radiation exposure. Water is sprayed onto the waste, which is then moved by an auger through microwaves generated by a series of microwave power packs. Volatile materials and water are driven off by heat generated during the process. The resulting waste is a relatively dry granular material suited to landfill.

Microwaving is suitable for the bulk of clinical and related wastes, excluding body parts, pharmaceuticals including cytotoxics, and radioactive wastes.

Chemical disinfection.

Chemical disinfection, which includes physical maceration (shredding or grinding) is a suitable treatment for small amounts of clinical and related wastes. This treatment usually involves an initial grinding/shredding of the waste, which is then soaked in a liquid disinfectant. Agents used include sodium hypochlorite, and hydrogen peroxide and lime.

Subject to the approval of the relevant State or Territory authorities, the spent liquid can be discharged to sewers and the solid residue can be disposed of in a landfill.

Chemical disinfection is not a suitable treatment method for human body parts, pharmaceuticals including cytotoxics, or radioactive wastes.

Other treatment options.

Other technologies include:

- plasma arc torch;
- continuous-feed autoclave;
- pyrolysis and electro-oxidation;
- dry heat sterilisation involving quartz infrared treatment; and.
- radiation.

As technologies are continually being updated and developed, institutions should be open-minded with respect to their waste disposal options.

References:

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Automatic system for commercial accounting of power consumption

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According to the purpose ASCAP can be divided into two types: the systems of commercial accounting and technical accounting systems.

The commercial accounting – records electricity consumption (as well as gas, water, etc.) for cash settlement for her supplier. Accounting for such devices requires high accuracy.

The technical accounting processes are required to control energy consumption within the enterprise, all its enclosures, workshops, energy installations. Analysis of the statements technical accounting system gives business a number of opportunities to reduce energy consumption and power without impacting on production.

Operational-measuring by the method of collecting and processing information, these systems can perform statistical and operational-measuring functions. Statistical ASCAP performs the function of collecting and processing information for certain time periods, which is produced on the basis of analysis and calculations for consumed energy sources. Operational-measuring functions of ASCAP allows to conduct real-time tracking modes of consumption and quality of energy. This it applies not only electricity; but any type of energy – gas, steam, water, thermal energy [3].

The benefits of implementing automated systems ASCAP are as follows:

- rational energy consumption and increase in energy efficiency;